VOL. 4 OCTOBER • 1947 NO. 4

THE FOCAL SPOT

JOURNAL OF THE CANADIAN SOCIETY OF RADIOLOGICAL TECHNICIANS

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News Items from the Provinces

ALBERTA SOCIETY OF RADIOLOGICAL TECHNICIANS

CALGARY SECTION

After a recess of three months the Calgary Society of X-Ray Technicians held their first meeting of the Winter Session with an attendance of twenty regular and student members present, four of whom were newcomers to our group, one being a former Saskatchewan member in the person of Mr. J. Allan, who we hope will be as big an asset to us as he was to the Saskatchewan Society.

A report of the very successful Saskatoon Convention was given by Miss Frances Shaw who was the official Alberta delegate to the Convention, with an enlargement of the report being given by Mr. H. M. Welch who was Chairman of the Finance Committee, Chairman of the Pool Fund Committee and also the Resolution Committee Chairman.

Plans were discussed for the Winter Study Group and an announcement made by Miss Jo. Sutton, Chairman of the Study Group, that these studies would commence on October 20th and every Monday thereafter, the first series to be given by Mr. Cec. Bridgeman, of the Picker X-Ray Co., on X-Ray Physics.

It was sugested by Mr. John Welch, President, that we plan a few more social functions this season and Miss Frances Shaw, Social Convener, was instructed to make plans for a Hallowe'en Party.

Our plan at the present time is to make this a better attended year with much more of interest and help to all of us, both in and around Calgary.

—MARGARET ALEXANDER, R.T.

A complete account of the Edmonton Society activities for 1947 will be issued in the January Focal Spot.

—CLIFF GODWIN, R.T.

BRITISH COLUMBIA SOCIETY OF X-RAY TECHNICIANS

The September meeting of the Society inaugurated the Fall and Winter season. About thirty members attended to hear Mr. Stirling give a detailed report on the Convention. Mr. Stirling also demonstrated the salient features of some of the papers and explained the gadgets which were shown. He was accorded a very attentive hearing. After the meeting the members as usual gathered together for refreshments.

At the next meeting of the Society we are to have the pleasure of listening to a lecture illustrated by a movie by Mr. Al Flower, of the Victor X-Ray Corporation. This should prove to be of extreme interest to our members and we are hoping for a bumper attendance.

British Columbia has stolen a march on the Ontario Society. Through the generosity of the B.C. Cancer Institute the services of Dr. Batho of the Physics Department of the University of British Columbia have been obtained to give a series of lectures on Physics. This courtesy has been extended to all technicians in Vancouver at no cost. It is very gratifying to note that over twenty of our members are availing themselves of an opportunity to gather up some very useful information. There will be twenty lessons in the complete course. We are very grateful to the Cancer Institute for extending us this opportunity which will be greatly appreciated by all our members.

Every member of our Society is looking forward to the October issue of The Focal Spot to get the full information about the Convention. None of our members seemed to take kindly to the suggested increase in annual fees. However, with everything else increasing in cost I don't think anyone could

complain about the increase in dues, because they get full value for their investment.

Miss Margaret Haggerty, of the Vancouver General Hospital, is getting married this month. All members extend to her best wishes for a long and happy married life.

Now that the vacation period is over it is hoped that the members will turn out to meetings with renewed vigor.

Nominations for the Officers for 1948 will be accepted at the November meeting and members are hereby notified to give this matter their consideration so that we will have the best the Society has to offer.

—W. Q. STIRLING, R.T.
President.

NEW BRUNSWICK SOCIETY OF X-RAY TECHNICIANS

A regular meeting of the New Brunswick Society of X-Ray Technicians was held at the Moncton Hospital, October 25th, 1947, Miss Katherine Creelman presiding.

Following the business meeting, Miss Creelman read a report of her trip to Saskatoon to the C.S.R.T. Convention held there in September. Both Miss Creelman and Dr. Petrie exhorted all members who could possibly do so, to attend the next annual meeting of the Canadian Society, which will be held in the Province of Quebec early in the summer of 1948.

Dr. E. A. Petrie addressed the assembly on some of the fundamental principles of radiography, prefacing his remarks with the apt quotation, "There is no new thing under the sun." At the outset the speaker pointed out to the older members that while his topic might appear elementary, yet, "men needed to be reminded more than instructed," as Dr. Johnson pithily stated. In developing his subject, Dr. Petrie said there is need of understanding basic principles now that x-ray equipment has become so complicated. The student who knows principles fears no applications. Technicians should think of themselves as artists and the work they produce as an art.

A discussion period based on this address followed, in which Dr. H. R. Ripley took an active part.

Dr. Petrie showed a number of scenic Kodachrome transparencies, after which refreshments were served by Miss Creelman, assisted by Mr. David McLaughlin.

The next meeting is scheduled to be held at St. Joseph's Hospital, Saint John.

—BEATRICE B. MAIN, R.T.,
Sub-Editor.

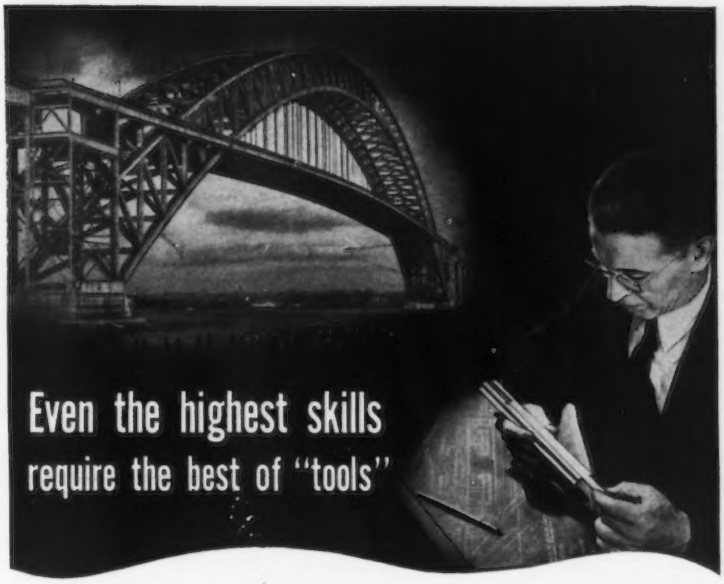
MARRIAGE ANNOUNCEMENTS

The New Brunswick Society of X-Ray Technicians wishes to announce the marriage of Grace I. O'Neil (X-ray technician at St. Joseph's Hospital, Saint John), to John Kern; also the marriage of Beatrice B. Main (X-ray technician at Lancaster Military Hospital, Saint John), to Stanley C. Bustin, Both marriages have just taken place this fall.

ONTARIO SOCIETY OF RADIOGRAPHERS

EASTERN SECTION

The Fall meeting of the Eastern Section of The Ontario Society of Radiographers was held on October 4th, in Brockville, Ont. A brief business meeting was held, at which Sister Mary Vincentia, R.N., was appointed Chairman of the Eastern Section. Miss Irene Tyler, Brockville General Hospital, was appointed Secretary. An interesting technical meeting followed. Mr. Peter Lamb of the National Research Council, Ottawa, gave an instructive talk on Industrial X-Ray work. He showed films of castings taken by x-rays



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and by radium. Miss Grace Froates, Kingston General Hospital, gave a short talk on "The Effect of Breathing During Exposure of a Dorsal Spine Radiograph." Miss Froates showed films demonstrating the improvement when the patient is allowed to breathe during the exposure. During the refreshment period Miss Olive Casselman of the Kingston Cancer Clinic gave us some of the highlights of the Ontario Convention held in Toronto.

—BEATRICE E. BLAIR.

CENTRAL SECTION

The Fall meeting of the Central Section was held at the Royal York Hotel, in the Library, on November 14th, 1947, at 8 o'clock.

Mr. Douglas Wise, Chief Technician of the Ontario Department of Health, Tuberculosis Prevention Division, opened the programme with a very interesting talk on Miniature Radiography. Dr. C. A. Wicks, Superintendent of Toronto Hospital, Weston, Director of Chest Survey, National Sanatorium Association, gave a very interesting talk, which was folowed by a moving picture of Routine Chest X-ray for Hospital admissions. He demonstrated a routine procedure on this particular subject and it was very helpful for those who may be concerned with this matter.

This was followed by another moving picture on Intravenous Pyelography through the courtesy of Mr. Ralph Broley, of the Winthrop Chemical Co., Windsor, Ontario.

It was unfortunate that time did not permit all of the questions to be answered by the Quiz-X. Mr. George Reason answered the question on the status of Radiographers, as far as their affiliation with the Society is concerned. Mr. Ralph Davidson, of Victor X-ray Corporation, demonstrated the practical use of the Planogram and its importance in Chest Radiography. Mr. Walter Whitehouse answered questions on Routine Skull Radiography.

There were over sixty members and guests present and your committee extends a vote of thanks to the above mentioned for appearing on the programme and making it a successful evening.

—JOHN H. GUTHRIE, R.T.,
Chairman.

IMPORTANT ANNOUNCEMENT REGARDING PROPOSED LECTURE COURSE

The Executive Committee of the O.S.R. has received a plan for a projected course of Evening Classes for Student Members of the O.S.R. and any other Technicians who are desirous of a refresher course. This scheme is in the embryo stage, pending the response of our members. If the response merits it, further plans will be proceeded with to establish the proposed course.

This plan was submitted by an individual who is fully qualified to lecture on subjects related to Radiography, both medical and scientific, and it is contemplated holding these lectures in Toronto.

We would like to hear from all our members, as to their opinion of such a proposal and their reaction and desire to attend such a proposed course.

Kindly send your replies as soon as possible to the Secretary-Treasurer, O.S.R., Miss O. Casselman, R.N., M.O.S.R., 325 Earl St., Kingston, Ont.

Further plans for this course will depend on the response we receive to this query.

Following is an outline of the course as submitted to your Executive Committee.

The following subjects would be dealt with. Additional subjects would be dealt with, or less stress laid on some of them, in accordance with the wishes of the students.

1. Elementary Physics—with special reference to electricity and x-rays.
2. Elementary Anatomy—with special reference to the osseous system, and other structures shown in x-ray films.
3. Elementary Principles of Photography—with particular reference to the processing of x-ray films.
4. Modern Apparatus—description and practical use of.
5. Practical Radiography—positioning, exposure, etc.
6. The Management of the Sick Person.
7. Elementary Medical Terminology.
8. Special Procedures—examination of the urinary system, localization of foreign bodies, etc.

It is expected that the course of lectures would run for about three months, with three two-hour lecture periods per week, or two three-hour periods. These would be arranged to the students' convenience.

The cost of the lecture course per student will depend in some measure on the number of students in the class, but it is expected that with approximately fifteen students cost per student would be approximately $35.

The object of this course is essentially practical, but stress will be laid on the theoretical principles which the student might have difficulty in learning on his own.

(*continued on page 197*)

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The Focal Spot

Journal of the Canadian Society of Radiological Technicians

Volume 4 OCTOBER 1947 *Number 4*

Improved Lateral Projections of Thoracic Spine

By S. G. JOHNSTON, R.T.

General Hospital, Moose Jaw, Sask.

THE matter contained in this paper is chiefly an attempt to answer from our own experience, the following questions:

(1) Should the patient be instructed to breathe gently during the exposure, while Lateral and Latero-posterior views of the Thoracic Vertebrae are being made?

(2) Is close-range radiography of any value for these two projections?

There is no doubt that radiographs of the lateral dorsal spine have more diagnostic value when the patient is completely immobilized, and shallow breathing allowed during a compartively long exposure, at the usual 36-40 inch focal film distances. Breathing will obliterate the shadows of the lung tissues, resulting in a clean-cut view of the vertebrae and interspaces far superior to the usual technique employed.

Reduction of the voltage, the use of a cone or cut-out diaphragms of various sizes and a short focal-film distance over a suspicious area will demonstrate any abnormal changes which may be present. Here we have a short focal-film distance combined with gentle breathing which I think shows some remarkable results; in fact, the vertebrae appear to stand out in relief, particularly when the patient is in a plaster cast. Contrast is improved and detail is not lost. True, some magnification is present, but in most cases this is a help rather than a hindrance to the Radiologist.

It will not be necessary here for me to describe the anatomical structure of the dorsal spine. This information may be obtained from any standard textbook on anatomy.

The exposure factors can best be worked out on your own apparatus, but as these exposures range from ten to twenty seconds, it is obvious that not more than ten milliamperes are necessary, and, of course, a filter of lmm.al.

Immobilization

This is to me the most important phase of all, for the Radiologist will overlook a slight error in positioning the patient or a film a little too light or dark; but motion will spoil any radiograph for diagnostic purposes.

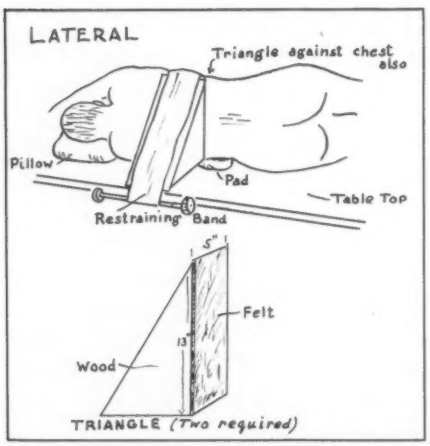
Immobilization, then, must be perfect. The compression band alone or with sandbags is not sufficient for complete security of the patient. For immobilization of the spine in the true

Given at the C.S.R.T. Convention, Saskatoon, September, 1947.

lateral position we have devised wooden triangles 13 by 5 inches padded with felt which are placed anterior and posterior to the patient over which the restraining band is tightly drawn, thus holding the patient securely for the required exposure. We have found this method satisfactory for lateral spine projections.

Positioning (Lateral)

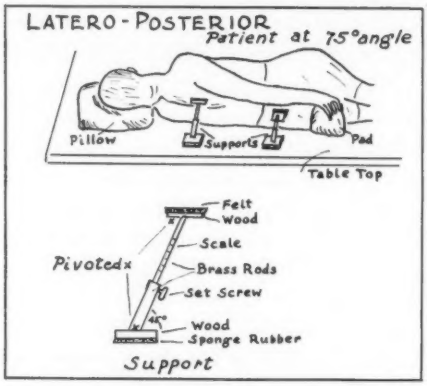
The patient is placed laterally recumbent on the radiographic table, the vertebral column being aligned to coincide with the long centre axis of the Potter-Bucky diaphragm, and the median plane being as nearly parallel as possible to the plane of the film. The uppermost arm is extended so that the hand can grasp the table end or a conveniently placed sandbag. A pillow is used to support the head. The underarm is flexed and rests on the table.



Some types of patients require padding at the waist line so that the spine is parallel to the table top. Sandbags under and between the ankles and knees make for comfort of the patient while remaining in this position. One half of a 14 x 17 or, better still, a 7 x 17 cassette is the usual size for lateral spine projections. With the triangles in position, the compression band is tightened and the patient is instructed to breathe gently during the exposure. Project the central ray over the region of the 7th thoracic vertebra. The length of the exposure is from 10 to 20 seconds.

Positioning (Latero-posterior)

This position is especially for the thoracic intervertebral articulations, and as Fuchs states, it must be a precise procedure because of the narrowness of the joint spaces that must be accurately projected. For this position



we dispense with the posterior triangles and use supports similar to those described by Fuchs.

The base is of wood and sponge rubber, the shaft of brass rods which slide one into the other, adjustable in length and can be locked in position with a thumb set-screw. The top, which is next to the patient, is of wood padded with felt.

The brass rod is marked with a scale

from 50 to 90 and leans from the table top to the patient at an angle of 45 degrees.

Now when the base is placed on a marked spot on the table top, the rod extended to the scapula of a patient in a true lateral position the scale reads 90. With the patient in a true lateral position the lowermost shoulder is drawn forward with the arm flexed at right angles and rests on the table top with the palm up. The upper arm lies somewhat posteriorily alongside the body. Then the trunk is rotated posteriorily until the scale on the rod reads 75, where the support is locked in position. Another such support is used at the sacral area. The patient is now in a semi-lateral position at an angle of approximately 75 degrees, which most authorities agree will best visualize the anatomic details of the thoracic intervertebral articulations and contiguous structures on the resultant roentgenogram. The anterior triangle is left in position which prevents the patient from slipping. Compression is then applied over the patient with the uppermost shoulder resting on the support directly beneath the scapula. Centre about 4 cm. anterior to the head of the humerus next the tube when the four upper vertebrae are to be visualized, and over the 7th dorsal vertebrae for the complete dorsal spine.

We found it difficult to duplicate results when both sides were taken for comparison. Others, I believe, have experienced the same difficulty. If a spot is marked on the table top where the base of the support will stand, and another spot marked the same distance from the opposite side, and markings are made on the patient with a skin pencil where the shoulder will rest, this will be a guide for comparable roentgenograms when both right and left latero-posteriors are requested.

Any suspicious area can be ringed with a cone at close range, with gentle breathing allowed, but close range work should not be attempted with non-shockproof apparatus, unless the patient is protected with sheet rubber directly under the tube terminals.

Make sure that the long axis of the tube is longitudinal to the length of the Bucky diaphragm. At times it is advantageous to tilt the tube. When this is done with a line focus tube, especially at short focal film distances, better exposure results will be obtained when the following rule is observed:

"Always tilt the tube so that the angle made by the plane of the target face and the plane of the film becomes smaller." This will, to some extent, lessen the anode-heel effect.

Conclusion

The subject matter which is contained in this paper is not new, but the principles which are outlined could be practised more extensively for the improvement of lateral projections of the Thoracic Vertebrae.

REFERENCES

Thoracic Vertebrae (Part 2). Arthur W. Fuchs. Radiography & Clinical Photography Vol. 17, No. 3, 1941 Eastman Kodak Co.

Some Radiographic Techniques in Which Movement is Utilized. Elmer W. Holly. Radiography & Clinical Photography, Vol. 18, 1942, No. 4.

Close-Range Radiography. Edith L. Brill, R.T. The X-ray Technician, Vol. 16, No. 3, November, 1944.

Radiography of the Shoulder Girdle

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IN the majority of cases, where an injury has been sustained, a stereo A.P. of the shoulder which includes the entire length of the clavicle, is sufficient to determine if a fracture is present or not, and if there is a fracture, the extent of the injury. However, in some cases additional films must be taken to enable the radiologist to give a definite diagnosis on the full extent of the injury.

Stereo A.P. Shoulder

The stereo A.P. shoulder may be taken with the patient lying supine on the table, but if he is a walking case it is usually much easier to put the table in the verticle position and have the patient stand with his back to the table. This may be slightly more work for the technician but it is much easier for the patient. In this position he is easily immobilized by means of a compression band across the lower chest. Technical factors on a shoulder measuring 13cm using ultra speed film and par speed screens are 36″ distance— 58 K.V.P. 50 M.A.S. Bucky.

This examination may be carried out with very little discomfort to the patient and if he has his arm in a sling, without disturbing it in any way. These films should be developed and shown to the radiologist before doing further examination.

After the radiologist has seen the wet stereo films, he may ask for additional films such as tangental clavicle, lateral scapula, lateral head and neck of humerus or both shoulders on one film for comparison.

Given at the C.S.R.T. Convention, Saskatoon, September, 1947.

Tangental Clavicle

This projection is very similar to a lordotic chest but that would be a very difficult position for a man with an injury to a shoulder. The best results are obtained with the patient standing, facing the Bucky, injured shoulder as close to table as possible. The tube is raised above the patient's head with a 40 degree tilt to the feet, central ray passing through the shoulder. If the arm is in a sling, the same result, with slightly more distortion, may be obtained in the A.P. Position with a 40° tilt to the head, tube centered to shoulder, centre ray passing through clavicle.

Technical factors — 36 ins. — 40 M.A.S. 55 K.V.P. — Bucky. This same projection gives a very good view of the corocoid process also.

Scapula:

The scapula is radiographed in two positions, A.P. and lateral. The A.P. should be retaken using 5 K.V.P. more than on the stereo A.P. shoulder.

The lateral view is easier to take in an upright position as it is much easier to position the patient. First position the patient in a P.A. position with the hand on the affected side on the opposite shoulder. Place the injured

shoulder against the table and rotate 15°, in the right anterior oblique position for the right scapula and the left anterior oblique, for the left scapula. Central ray passes through the centre of the scapula at right angles to the film.

Technique: 36 ins. — 50 M.A.S. 66 K.V.P. Medium size cone. Bucky.

Lateral Shoulder:

This examination may be carried out in two positions. First, patient is positioned in the supine position with a pillow under the unaffected shoulder and back, raising the injured shoulder about two to three inches off the table. Support the elbow with a sandbag bringing the humerus parallel with the table, and have the elbow about 4 inches from the side. Prop an 8 x 10 film against the shoulder parallel to the clavicle and pushed in as close to the patient's neck as possible. Displace tube to foot of the table and direct central ray to plate, parallel to the patient's body. Technique: 60 ins. — 50 M.A.S. 60 K.V.P. Tunnel Cone — No grid. This view gives the head and neck of the humerus and the relation of the head to the glenoid.

If the patient's arm is in a sling or he cannot move his arm from his side, a lateral view may be taken through the chest. The patient stands in a lateral position with the affected side against the Bucky and the opposite arm over his head. Rotate the patient 5° posteriorly from the true lateral position and tilt the tube 5° upwards from the horizontal position. Place the top of an 8 x 10 film about 2 inches above the top of the shoulder and centre tube to the film.

Techinque: 36 ins. — 200 M.A.S. 70 K.V.P. Medium cone. Bucky.

Acromio-Clavicular Articulation:

Occasionally when there is no fracture present the radiologist will suspect there is some separation of the acromio-clavicular articulation. To demonstrate this the patient is given a 3 lb. sandbag in either hand and instructed to let both arms hand loosely at the sides. These weights are held for at least three minutes. At the end of that time a single upright film is taken with both shoulders on the same film, patient still holding the weights.

Techique: 48 ins. 50 M.A.S. 55 K.V.P. Bucky.

In cases where pathology other than fracture or dislocation is being sought, three views of the shoulder are taken. These are all A.P. with the humerus in (1) internal rotation, (2) external rotation, (3) abduction. These films are taken using non-screen film on the Bucky and combine bony as well as soft tissue detail, and are very effective in showing calcification in the soft tissues. Technique: 36 ins. 250 M.A.S. 62 K.V.P. Non-screen film — Bucky. Med., Cone. It is not recommended that this technique be used for fracture cases due to the length of exposure.

Radiography of the Gastro-Intestinal Tract

By A. E. PERRY, M.D.

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IN addressing you to-day, I am very conscious that the radiologist and the radiographer have many common interests. Our mutual problems tie us together inseparably and your problems naturally are of interest to us. Consequently I consider it a privilege, as well as a duty, to attend your convention as a guest speaker, hoping thereby to contribute something towards its success. My subject may be of greater interest to those outside of the big hospitals and bigger cities than to those under the supervision of a radiologist. If some of you find that some of my remarks are uninteresting, kindly bear with me, hoping that others may find some pearls amongst the oysters. This subject could be expanded greatly, but I shall try to keep its scope within reasonable time limits.

Frequently I receive plates from outside points which have been mailed to me for interpretation. Usually the only information that I obtain is the patient's name, no history and nothing else that is helpful. Each time, as I open the envelope, there is an expectant note, as I never know just what I am going to see. Some of the plates are good, some not so good, and others definitely bad. Many of the statements that I am about to make may be taken as irrelevant but I can assure you that at some time plates have been received which have prompted every slighting remark that I may seem to make. Nor do I wish to appear ungrateful or lacking in appreciation of your efforts. I know too well the difficulties under which some of your work is done. So it is in a spirit of helpfulness that I approach this problem and with the sincere hope that some of you may profit thereby.

It seems almost trite and commonplace to point out that the purpose of radiographs is to make a record of shadows which can be interpreted as representing anatomical structures or pathological conditions which can be interpreted by those trained to indicate certain diagnoses. The radiologist fondly and sometimes despairingly hopes that all shadows that should be cast will appear in greater or less detail upon the films. If the plate is of high quality, he may be able to make a really dazzling, or if not dazzling, perhaps an accurate diagnosis. If the quality of the plate is impaired, then less information is available and the probability of making a correct diagnosis is reduced.

The relationship of the skill of the radiologist to the quality of plates taken is frequently overlooked. No matter how clever or well-trained he may be, the limiting factor of his skill is the quality of the films upon which he has to make his diagnosis. This truth seems to be obvious to me and yet the surprising thing is that it seems to be so frequently overlooked by those supplying the plates. Some of the plates would try the patience of a saint, and I am no saint. One wonders at times just how any technician can expect a radiologist or any one else to

* Presented at the Annual Meeting, Saskatchewan Society of X-Ray Technicians, May, 1947.

make an interpretation upon a film which is the closest approach to a total blank that one could wish. The other extreme is to make it a total black-out. If I could only show you some of the films which I have received from time to time you would understand much better why I appear to be a bit caustic if not definitely sulphuric in tone. I am not a mystic nor a seer, nor am I the son of a seer. I do not make use of a crystal ball in arriving at a diagnosis, despite all rumours to the contrary. Simply placing a plate in the same room as the patient, making an exposure so that varying degrees of fog appear on the plate, does not constitute a radiograph. The mailing of such a plate to the radiologist for interpretation with only the name showing falls far short of a radiological service. The information has to be on the plate for the radiologist.

To enumerate all the faults would be time-consuming and unnecessary. Gross over-exposure, under-exposure, markers on the wrong side, series of plates submitted supposedly on the same patient where obviously they were not on the same patient, poorly positioned, insufficient number of plates, poor processing and washing, are all criticisms which I could make. I recall one film that I received for interpretation. I would defy any one to see through it. It was covered with dried fixing solution so that it was quite opaque. After washing this free, I discovered that it had only been partially fixed and so it received treatment in the fixer, but by that time it would not clear properly. Many plates I have had to return, refusing to pass any opinion upon them. I frequently wonder if the patient paid full price for this service. Many of these criticisms are only rare but many of them are frequent to a greater or less degree. Many of my remarks apply to all types of plates, but probably the greatest complaint would be levelled at plates made of the gastro-intestinal tract.

A gastric examination under ordinary circumstances should be carried out by a radiologist. A gastric examination is by no means complete without a fluoroscopic examination. Any other method is stopping short of the optimum, as one type of examination supplements the other and films or fluoroscopic examination alone is not a complete examination. At the same time I admit that there are difficulties in this province, where distances are great and radiologists are few and far between. Time and lack of money may make it difficult to travel to proper diagnostic facilities. The practice of taking gastric plates and mailing the plates for interpretation is, at best, a second-rate proceeding and should be considered as such. When all the factors are taken into consideration it may be justified but I do not consider it a first class procedure. When such procedures are carried out, the role of the technician is important as he alone is largely responsible for the plates obtained. The rest of my remarks are made with this in mind.

Gastrics carried out under the above circumstances deprive the radiologist of personal contact with the patient. He has under ordinary circumstances the opportunity to examine the patient by means of a fluoroscope, and also to palpate the abdomen for masses and tender points. He has the opportunity

to ask questions and to gain a history. He has a chance to correlate what he sees with the patient's general condition and complaints. It is during this part of the examination that many interesting and sometimes amusing circumstances arise. One patient I recall stated that she only had pain when she ate sauerkraut and ice cream.

For those who work without the supervision of a radiologist, the following rules seem to be essential for gastric examinations.

1. The plates must show all of the stomach and duodenum.
2. The patient must be positioned so that all the parts of the stomach and duodenum can be seen, i.e., one or more positions.
3. The exposure must be sufficiently correct so that the stomach and duodenum can be outlined.
4. An adequate number of plates must be taken.
5. Movement must be reduced to a minimum.

If thought was given to the anatomy of the stomach in its relationship to the abdomen, better visualizaion of the stomach and its various parts would be obtained. It is not sufficient to outline the body of the stomach or the cardiac end to the exclusion of the remaining parts. This frequently happens. Most gastric pathology is found in the pyloric end and it is necessary to show this part well and the body and cardiac end can be shown by additional plates if necessary. When the patient is lying supine the abdominal cavity slopes downward to the diaphragm and into the pelvis. As far as the stomach is concerned, it tends to move upward into the region directly below the diaphragm and the meal moves into the cardiac end. The cardiac end is best visualized in this position, but not the pyloric portion. In order to demonstrate the pyloric end well, the position of the patient needs to be reversed. Prone position places the body and pyloric portions of the stomach in the most dependent position. Pillows supporting the chest and pelvis accentuate the dependence. There is one anatomical consideration to remember. The lumbar spine projects forward and will compress the pyloric portion of the stomach between it and the abdominal wall, squeezing the barium out and at times simulating a filling defect which may be mistaken for pathology. The patient should be positioned to correct this; turning the patient about 45 degrees to the right will usually relieve the pressure and in addition will frequently outline the duodenum to much greater advantage. Routinely, when the fluoroscopic screen is not used for positioning, I would suggest that all patients be rotated in this direction.

Some gastrics come to me taken entirely upon 14 x 17 films and only one or two films have been used. If you ask the technician about multiple films, they may answer that the expense is too great. If the films are properly centered, the entire stomach can be put upon an 8 x 10 except in unusual circumstances. A series of films this size can be used and the expense kept within reasonable limits and they will be much more valuable for interpretation. A smaller film, the 6½ x 8½, can also be used to advantage for some of the exposures as this will cover most of the stomach, and can be centered for the pylorus and duodenum specifically.

In the fluoroscope one can see the changing position of the stomach with peristalsis and upon palpation. This observation can only be transferred to plates by taking several. A number of plates should be taken of the stomach in varying positions. I consider that five or six should be taken in the prone position, and at least one to show the cardiac end, as the minimum number. Also remember that the patient is paying a fee that is sufficient to cover an adequate examination and there is no justification in trying to cut the number of plates to an inadequate amount. For the 4 or 5 hour and 24 hour examination larger plates are employed, such as 11 x 14 or 14 x 17, depending upon the size of the patient.

Complete examination of the patient by taking an adequate number of plates will give visualization of all the parts of the stomach and duodenum. Defects may show in some plates and not in others and consequently lead to a diagnosis which otherwise might be missed and, conversely, a shadow may appear in one plate which other plates show to have little or no significance. The following-on plates show the emptying time of the stomach, the rate at which the meal flows through the small bowel and colon. It also gives information regarding the condition of the small bowel and some idea of the colon. The follow-on examination, however, does not show the colon well and at times is quite inadequate. For a complete examination of the colon a barium enema is necessary.

Exposure factors should hardly need to be discussed except that some plates come in so dense that you can hardly see through them, and others are so light that the margins of the stomach and duodenum can hardly be seen. Such plates are practically valueless. Good exposures are just as important for gastrics as for any other part of the body. There is no particular virtue in using a long target-film distance. The following factors will give a good film at 32 inch distance. For the average patient of 16 to 18 cms. thickness, use about 65 to 70 kvp and 60 mas. with par-speed screens and Bucky diaphragm.

Up to this point I have mentioned positioning and exposure factors, but I have not mentioned the time factor of the exposure. I have met technicians who seem to live and breathe solely to get contrast in their films. They have insisted in retaining contrast no matter how much it is pointed out that a good contrasty plate is not always a good diagnostic plate. White whites and black blacks do not always give all the information that can be obtained. Contrast is frequently desirable in gastric plates, but other features are more desirable than contrast. Contrast may be retained with good definition in high-powered units, but the retention of contrast in gastric plates may sacrifice detail. Peristalsis normally is present in the stomach all the time. We cannot suspend this movement while the exposure is being made. Therefore, we must make the exposure time as short as possible. The technician must take stock of the equipment that he or she has. The exposure factors must be so arranged that time is brought to a minimum, if it is greater than ½ second. In order to do this, bring the tube down to as low as 30 inch distance if necessary. The kvp may be increased in order to

shorten exposure time. Last but not least, the use of the Bucky diaphragm can be dispensed with. Many gastric plates come in, obviously taken with the Bucky, with beautiful contrast but with so much movement that they are practically worthless. Consequently, I would urge that plates be taken without the Bucky diaphragm if it means that the time has to be prolonged much beyond ½ second. I admit that the resulting plates will not be as contrasty and if the duodenal cap happens to lie over the lumbar spine, it will be harder to visualize, but I am of the opinion that the loss in contrast is more than made up by the greater degree of definition. Perhaps I should also add that if the equipment does not permit the plates to be made in less than ¾ second or at the most 1 second, it is questionable whether they should ever be attempted.

I mentioned above that the proper examination of the colon required the use of the barium enema. If a vote were taken of the most unpopular proceeding in the x-ray department, I am sure that barium enemas would rank well in the front. On one occasion not long ago I was reading a text book on the examination of bowel contents and feces. The author commented that few doctors were expert in such an examination and he added that "the person involved needed a taste for the procedure." In order for us to enjoy the administration of an enema, it could be said that we need a taste for it. In spite of many objectionable features it is a most necessary procedure and at times is extremely valuable. So I have no apologies when it is necessary.

Naturally the colon is filled easiest and best if it is empty to start with. Nothing empties the colon quite so well as castor oil, ounces one and a half. There may be contra indications for the use of castor oil. The physician in charge may object to such preparation; then simple enemas are in order until clear. The barium enema is preferably not given for about four hours in order for the residual fluid to be absorbed. If the preparation has been adequate and particularly with effective use of castor oil, the colon usually fills easily. Half-way measures are not good enough. The last inch of the colon is more important than the first because the first inch can be felt or seen. It is just as important to get good visualization of the cecum as it is to fill the sigmoid adequately. In my opinion this can only be accomplished consistently under the fluoroscope, otherwise, the technician has no idea when the colon is full.

One has to contend with the patient who starts to squirm and complain before the enema is started. There is also the patient who has some pathology that makes it impossible to retain enemas. This is forgiveable when we know the circumstances. Then there is the individual who quietly lets it expel without saying a word, and may say "Did you want me to hold it?" There are difficulties too numerous to mention, but fairly well known to all. In spite of all these tribulations that befall us, every effort must be made to fill the colon. If no obstruction can be seen, the colon can usually be filled if we are sufficiently persistent. Check the tube to see that it is not plugged by barium. Starting with the pressure low is good, from my experience. Patients tolerate it better as the natural impulse after the sigmoid colon is dis-

tended is to evacuate, whether the filling is from above or below. With some people this urge is almost irresistable and others just do not make much effort to resist. Once the sigmoid is filled, then pressure may be increased if necessary.

If a colon is examined without the presence of a doctor or a radiologist, I think the filling should be observed under the fluoroscope, using all due precautions about the use of a fluoroscope. A colon partially filled may give a false sense of security if no pathology is demonstrated. In fact it might be worse than no examination at all. After the barium is injected, then plates should be taken as follows: A single film made of the entire abdomen in the prone position is necessary. A good view of the sigmoid will not be obtained in most cases unless it is taken obliquely. For this view I rotate the patient onto the right side about 45 degrees and take a film, using 10 by 12 inch films or larger. Another view that is occasionally of value is a true lateral of the rectum and sigmoid area. This may be taken on a 10 x 12 film. The patient should then be allowed to evacuate and another film taken after, with the bowel empty or nearly so. In some selected cases it may be desirable to do a double contrast enema, in which air is injected into the rectum through a tube in order to fill the colon with gas. The barium still present within the colon distended with air sometimes gives additional information. This, however, is usually done under the direction of a radiologist.

With some patients I found it almost impossible to get good filling until I obtained a Vardex tube, which is an enema tube with a rubber bulb near the tip which can be distended inside the rectum. This forms a fairly effective plug and only a few colons cannot be filled to the cecum or the point of obstruction by means of this tip. Where routine barium enemas are being done, I consider this to be a very valuable piece of equipment.

May I sum up a few of these points very briefly. Whether doing barium enemas or gastric series, it is highly important that all the information possible be on the plates. This can only be obtained by:

1. Good filling of the part examined.
2. Good positioning in order to show the part.
3. An adequate number of plates to show the part.
4. Optimum exposure factors.
5. Proper processing of the plates.

If all these general principles were followed, I am sure that the plates taken and submitted from time to time for interpretation would be of much greater value than many that reach my hands.

Placentagrams (Filter Method 1947)*

By MARY F. CAMERON, R.T.
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THE purpose of this article is to present a further report on the technical procedure of placentography as accomplished by means of the filter method. The preliminary technical report of the development of this method in our laboratory was presented to the Sixth Annual Meeting of the Ontario Society of Radiographers in May, 1941, and was published in the Ontario Radiographer, Volume II, No. 3, 1941. [1]

Following the successful use of the method in fifty-two cases the radiological findings of which were proven by Caesarean Section or obstetrical examination, Drs. Vaughan, Weaver and Adamson presented their report to the Canadian Gynecological Travel Society, November 1, 1941, and the Canadian Association of Radiologists Mid-Winter Session, London, Ontario, January 5, 1942. This report was published in the Canadian Medical Association Journal, 46, 1942. [2]

In June, 1942, this work was again presented technically at the 17th Annual Meeting of The American Society of X-Ray Technicians in Chicago. In this paper, successful results were reported in eighty-five cases. This article was published in the X-Ray Technician, 1942. [3] At that time it was reported that continued efforts were being made by means of fluoroscopy to develop a filter of varying thickness of copper and aluminum which would provide a filtration effect equivalent to that obtained with the use of opaque plastic.

In October, 1942, the technical paper presented in Chicago was repeated at the Annual Meeting of the Western New York Society of X-Ray Technicians in Rochester, New York. On this occasion, an addenda to this paper stated that "a suitable metal filter had now been devised, incorporated in a cone base which could be inserted in the tube carriage." Following this meeting, these filters were purchased by two hospital laboratories in Rochester. Time and use proved that, though the correct amount of filtration was provided in this filter, it was heavy and laborious to handle and showed a crescent-shaped line in the radiographs due to the markedly definite border of the sheet of coppr within it.

Further filters were made using alloyed metals, and these were tested by comparison with barium plastic filters under the fluoroscope. Eventually a satisfactory alloy of copper and aluminum was found. This was applied to an aluminum base and was 5 cms. thick on its anterior border, graded to 2 cms .at the upper posterior, the lower posterior portion being cut away so that no filter should lie over the iliac crests. This filter was placed on a turn screw and incorporated within a cone, the target-filter distance being six and three-quarters inches. The filter could be reversed by the turn screw so that its use could be applied

* Presented at the 12th Annual Convention of the Ontario Society of Radiographers, June, 1947.

to both right and left lateral radiographs without removing the cone from the tube carriage.

This improved type of filter cone was presented at the Annual Meeting of the Quebec Society of X-Ray Technicians in Montreal, May, 1944, in connection with a technical paper entitled "Radiographic Examination for Pregnancy." It is not my purpose to-day to review the earlier history or anatomical considerations of this work as previously published, but rather from the standpoint of experience gained in the radiography of four hundred and fifty pregnancy cases for position of placental site, to re-affirm the major points of our original technique supplementing these earlier findings with certain modifications.

Technical Observations:

In determining a base line technique in this work, three factors have been found to improve accuracy:

(1) The use of measuring calipers.

(2) Classification of the type of patient being x-rayed.

(3) Variation of base line technique in keeping with type of film used.

1. Caliper Measurement:

We have revised our earlier impression that the use of measuring calipers would prove ineffective due to the varying amount of amniotic fluid present. As the absorption of roentgen rays in water is similar to that in body tissue, depth measurement, though not infallible, is the only method by which actual calculation of a base line technique may be arrived at.

2. Classification of Type of Patient:

In the use of the filter method for radiography of placenta, the physique of the patient is of significance in the selection of techn'cal factors. The position of the open portion of the filter must be maintained above the iliac crests. Therefore, it is obvious that, as the abdomen of the slender patient of good musculature will not extend as far forward as that of the obese type with sagging muscles, a lesser degree of filtration will be received by the anterior wall of the uterus of this patient and over-penetration is likely to occur. This patient will have little difficulty in controlling respiration. It is preferable, therefore, to reduce the KPV, increasing the number of milliampere seconds used.

In radiography of the extremely obese patient, or in cases of polyhydramnios and multiple pregnancies, the maximum degree of filtration will be received by the anterior border of the uterus. The use of high kilovoltage is essential, shortening the time factor as much as possible to obviate movement. (The consequent increase of secondary radiation is of little disadvantage.)

3. Variation of Base Line Technique in Keeping With Type of Film Used:

Film emulsions are known to vary in speed, contrast and latitude. With the use of films of high contrast, we have found the lower base line technique most applicable. This is presumably because there is less latitude in this type of film so that at lower KVP and high milliampere-seconds, fine differentiation of thin soft tissues may be

shown which with higher penetration would be "blacked out."

In radiography of the obese patient, increase of KVP and lessening of milliampere-seconds will prove necessary in obtaining cessation of movement. In this type of patient, however, there is considerable differentiation in the soft tissues. Consequently, no radiographic quality will be lost with the use of a less contrasty film of maximum latitude. Thus it has been our experience that the choice of film and selection of technique may be varied to advantage as follows:

Slender type of patient, firm, musculature—high-speed, contrast film; 70-75 KVP, 225-400 milliampere-seconds.

Obese type of patient, slack musculature — 80-85 KVP, 150-300 milliampere-seconds.

Vertical Film of Lower Uterine Segments:

It is desirable that films of the lower uterine segment should be in as true lateral position as possible. This can best be accomplished with least discomfort to the patient in the vertical position. The filter cone may still be used provided it is centred in the same manner as in the horizontal radiographs.

It is our preference, however, to centre in this instance over the lower uterine segment only, including the sacrosciatic notch, the central ray to enter at the femoral heads. This alteration in centering necessitates alteration in the position of the overlying filter as the lower border of the uterus will be approximately in the centre of the film.

In this position, therefore, we employ the use of the opaque plastic filter, its greatest depth applied to be over the anterior lower uterine segment. With the patient standing, the weight of the foetus and amniotic fluid causes the uterus to sag forward and down anterior to the pelvic bones, providing better visualization of the lower segment. Thus additional information may be obtained with the use of this position.

Summary:

1. We re-affirm the successful use of the Filter Method in radiography of the placenta.
2. The McGregor Clinic Filter Cone, as manufactured by Bexco (patent applied for), will provide a similar degree of filtration to that previously obtained in opaque plastic filters.
3. Certain modifications in technique as developed in the radiography of four hundred and fifty placenta cases are recommended for use.
4. The use of the vertical position in obtaining true lateral views of the lower uterine segment has provided additional diagnostic information.

REFERENCES

1. Cameron, Mary F.: Visualization of the Placenta by Soft Tissue Radiographs, The Ontario Radiographer, Vol. II, No. 3, July, 1941.
2. Vaughan, Charles E., Weaver, R. T., Adamson, D. L.: Roentgenographic Visualization of the Placenta, Utilizing the Plastic Filter, The Canadian Medical Association Journal, 46, 314-321, 1942.
3. Cameron, Mary F.: Placentagrams (Plastic Filter Method), The X-Ray Technician, 1942.
4. Cameron, Mary F.: Metal Filter, Addendum to Placentagrams (Plastic Filter Method), presented in October, 1942, to the Annual Meeting of the Western New York Society of X-Ray Technicians.
5. Cameron, Mary F.: Radiographic Examination for Pregnancy, presented in May, 1944, at the Annual Meeting of the Quebec Society of X-Ray Technicians, in Montreal.

Radiography of Children

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IT was not until after agreeing to give a paper on "Radiography of Children" that I realized the comprehensiveness of the title. Imagine giving a paper on "Radiography of Adults"! It would tend to develop into a text-book instead of a paper. So I now realize that the title of this paper should really have been "Some Differences in the Radiography of Children as Compared with that of Adults."

When one compares radiography of children with that of adults three main differences are evident.

1. The greater range of thickness of individual parts.
2. More likelihood of movement.
3. More variation in skeletal development.

Let us then deal with these differences in greater detail.

1. Thickness Range:

This ranges from less than one centimeter for an infant's hand to thirty-five centimeters for a lateral sacrum of an overgrown pituitary patient of 15 years. Each individual part has a considerable centimeter range. The upper extremities from 2 to 10 cm; the lower extremities from 3 to 12; the skull from 8 to 22; A.P. spines from 7 to 25 and lateral spines from 9 to 35 cm. In many parts age makes a difference in the exposure even though the centimeter measurements may be the same; admittedly not a great difference — maybe two or three kilovolts — but enough to spoil a critically correct rapid exposure, either by causing it to drop just below the point of correct penetration or by causing the penetration to be a little too much, thereby causing loss of brilliance in the radiograph. As a matter of fact at the present time we are considering the possibility of changing to a high kilovoltage technique on some of the parts, thereby getting less contrast but more soft tissue delineation and giving ourselves and the equipment a bit more leeway for error. However I will refer to this again later.

2. Movement:

This is, of course, linked with the thickness of the part because obviously if movement is to be overcome by a rapid exposure there is very little latitude for error in the miliampere-seconds or the kilovoltage and the greater the thickness the more difficult it is to get a good radiograph with a rapid exposure.

The alternative is to get the patient to keep still and it is surprising how many quite small children will keep still long enough for the relatively short exposures needed with modern equipment.

We have never found any advantage in using toys for the children in the x-ray department. The positioning is too critical for a child to be playing with a toy while being radiographed and it is better to get him interested in what you are doing than to have his attention distracted by something else. If the patient is the type who is going

* Presented at the Fifth Dominion Convention, Saskatoon, June, 1947.

to make a fuss, he will do so anyhow, and if his confidence can be obtained it seems to be accomplished just as easily by talking to him, telling him he is going to get his picture taken and that there is nothing to hurt him and getting him interested in what is being done. Seeing another child, who is not afraid, x-rayed, usually works well with all but the most timid or those who are quite irreconcilable. I have had a number of three-year-old children co-operate perfectly for nasal sinus radiographs, in spite of the fact that the face-down position is the one which children dislike most. With older children who are nervous I often, in the case of sinuses, let them watch the number printed on the film. Then, on masking the second film, I suggest that the patient put his hand on it while I turn on the x-ray so as to make sure there is nothing to feel as well as nothing to see. I recall one little fellow of three years old who, after having had his picture "took" enquired hopefully "Can I take your picture now?" Another type of patient, usually quite young, feels safe as long as nothing seems to be happening. With this type one can get the film under, tube centered, and then disappear into the control cabinet and make the exposure when a favourable opportunity offers without the patient realizing it. But for the really difficult type of patient the only thing to do is to make a rapid exposure.

3. More Variation in Skeletal Development:

This is not particularly important from the technician's standpoint but it is interesting and one should be familiar with it to work intelligently. Examining a radiograph of the tibia of a small child, for instance, one will note how the diaphysis, or shaft, is separated from the epiphysis or growing section at either end, by a space which is actually cartilage and eventually becomes ossified. This appearance is similar at the ends of all the long bones, differing at various ages, and is sometimes mistaken for an unusual type of fracture by those unfamiliar with the appearance of the bones of children. Incidentally, we often have to x-ray wrists, feet or knees of children for "bone age." From infancy to adolescence the age at which certain bones and epiphyses throughout the body ossify has been tabulated, so radiographs constitute a check on normal or abnormal growth.

Exposures:

We use three general types of exposure —— 'Slow" (½ to 2 seconds); "Fast" (one-tenth of a second), and "Ultra-fast" (one twenty-fifth second). With correct exposure no difference in radiographic quality can be seen in the result. (A lantern slide was shown). This slide shows two a.p. views of the same tibia on one 14 x 17 film. One had two-thirds of a second at 48 KV., using 75 ma. (50 ma.-seconds). The other had one fifteenth of a second at 56 Kv., with 150 ma. (10 ma.-seconds). So in this case the kilovoltage was increased by 8 and the time reduced to one-tenth of the "slow" exposure.

The radiograph from which this slide was made was taken some years ago, using screens. We are now using non-screen film for nearly all our non-plaster extremity work. We need speed to eliminate the possibility of movement, so in this type of work we use

30" instead of our customary 36 inches and use 200 ma., with 15 ma.-seconds, which is about one-twelfth of a second. If the instant for making the exposure is chosen carefully there are few patients who cannot be taken with this time. We use a convenient formula for these extremity non-screen exposures which we find works out very well. Keeping 35 inches and 15 ma.-seconds at 200 milliamperes constant, twice the centimeter thickness plus 41 equals the kilovoltage. In the case of dorso-plantar hands and feet we reduce the time to 8 ma.-seconds, otherwise they are too dark. If you wish to try this formula for non-scren film, decide what time and distance to use, experimentally fix the milliamperage and then, if the films are too light, increase the factor represented by 41 in the example just given, or if the films are too dark, decrease it. Having arrived at a satisfactory factor, it should work throughout the whole cm. range, although, of course, there is a point where the Bucky should be used and different exposures would have to be worked out. For instance we find that knees and femurs of patients over about 8 years old need the Bucky to keep down the secondary radiation when using non-screen film.*

If you prefer to use screens for extremities of children and already have an adult rapid technique for, say, a 10 cm. tibia, I think you will find that the tibia of a two-year old baby measuring 4 cm., will need about 10 kv. less. The exposures for the intermediate thicknesses between the 4 cm. baby and the 10 cm. adult can be figured on a basis of approximately 2 kv. per centimeter. However, as I mentioned before, age maks a certain difference so that an 8-year old with a five cm. tibia will need about 2 kv. more than a 3-year old with a tibia of the same thickness. That is, of course, with the Kv. we are using for contrasty screen radiographs. Using higher kilovoltages this effect would probably not be apparent.

I am somewhat hesitant about giving you exact exposures as used by us because of the difficulty of transposing from one machine to another. In our own department we could not get two machines to give identical exposures on the same settings, until they were adjusted to do so. However, they can be tested and the difference in radiographic output at a given setting ascertained.

For the benefit of those who are not familiar with radiographic calibration I will describe the method used. Two accessories are necessary—a spinning top and an aluminum step penetrometer. The spinning top is a heavy metal top with a small hole in the periphery. When placed on a film beneath an x-ray tube set for a rapid exposure, it records the number of impulses and thus checks the accuracy of the timer. The penetrometer is a series of aluminum steps increasing in thicknss in an even ratio. Placed on a film and radiographed it gives a series of increasing densities from white to balck. First make spinning top tests on the two machines and adjust the timer until the second machine is giving the same number of impulses as the first. One-tenth of a second is a convenient time to work at; this will give twelve impulses on 60 cycle current and five on 25 cycle. Now that you know that both machines

* Since this was written we have been experimenting with high kilovoltage technique for non-screen film with rather surprising results. Using 80 pkv., at 36" and an exposure varying from 5 to 10 ma-secs., without Bucky and from 25 to 50 with Bucky the latitude has proved to be remarkable.

are giving the same length exposure, lay the penetrometer along the 10 inch edge of a 10 x 12 film, protecting the rest of the film with lead. Make an exposure of one-quarter of a second with say 50 ma. at 54 Kv. Mark the Kv. with a lead marker. Cover this and move the penetrometer along to the next strip of film and make another exposure with everything constant but the Kv., which you advance to 56. You should get about five exposures on a 10 x 12 film, giving a range of Kv., from 54 to 62 in 2 Kv. steps. Now do the same with the second machine, giving exactly the same Kv. readings and being very careful to get ma. and time correct. Develop both films together. Comparing the two films you might find the degree of density at the same indicated kilovoltage identical but it is far more likely that the second machine will show the same density at a Kv. setting higher or lower than the first one. Having observed the marked kilovoltage which matches in density on the two films and noted the difference in indicated kilovoltage, you can get the same radiographic results from the second machine as you do from the first by merely adding or subtracting the number of Kv. indicated in the test as giving the same penetration.

While on this subject I might mention another thing. All modern machines compensate on the Kv. meter for the Kv. drop when using higher milliamperages. If this compensation is not correct, due to faulty setting when installed or to changes in valve characteristics during use, you will not be able to change from say 50 ma. to 200 ma. for a rapid exposure and still get the same penetration. Therefore, it is well to check this also with the penetrometer. Use a big enough film to get all the milliamperage settings on it. Set the machine for say 60 Kv. with 50 ma. and 2/5 second (20 ma.-seconds). Make a penetrometer test for each of the other settings, carefully setting the Kv. meter at 60 as the needle drops at the increased ma. settings, and adjusting the timer so that the milliampere-seconds are the same; i.e., at 100 ma. the timer would be set at 1/5 second (20 ma.-seconds) and at 200 at 1/10 second (20 ma.-seconds). If the timer is accurate and the Kv. meter compensation is correct all the exposures should have the same density throughout the aluminum steps. If they have not you will either have to compensate by adding so many Kv. for rapid exposures or call in the service man to correct the error by adjustments behind the panel. This is rather a long digression from my main theme but it does not seem to have been mentioned often and I thought it was worth drawing attention to.

I now propose to deal briefly, item by item, with some of the parts we are called upon to radiograph with children. I will mention the exposure settings we use, but of course cannot guarantee they will work out on other machines. Morover, there are, as I said before, so many different thicknesses in children. However, they may serve as a starting point if you have occasion to use them.

The method of holding infants and small children is important. Incidentally, this, of course, should not be done by members of the x-ray staff, nor too frequently by the same nurse. It is better to have the parents hold the children whenever possible.

Infant Wrist:

This is often needed to demonstrate possible rickets, scurvy, lead poisoning or other disturbances of the metabolism. In taking the wrist or forearm the hand should, of course, be supinated and the patient's hand held with the nurse's fingers (not the thumb) across the base of the thumb to prevent rotation of the forearm. The nurse's thumb should not lie on the film but be stretched to the edge of the film-holder. With her other hand the nurse holds the humerus and shoulder. She is standing on the opposite side to the tube-stand and the arm to be radiographed is on the tube-stand side. Thus she stretches across the patient and can use her arms to restrain the baby's body movements while holding the arm with her hands. The exposure using screens is 40 to 43 Kv., for 2 to 4 cm. wrists using 150 ma at 36" for one twenty-fifth of a second. An adult wrist with the same technique would take about 50 Kv.

Infant Legs:

The legs are often required at the same time as the wrists for metabolism disturbances. There are also many cases of bow legs in which the entire length from the pelvis to the ankles is put on one 14 x 17 film. Here the thighs are tied together with a bandage just above the knees. The nurse should hold the feet with the toes pointing straight up and with her thumbs over the instep. If she holds her fingers over the instep her hand is likely to hide the ankle joint. The correct A.P. position should of course be maintained and, as mentioned before, the feet should be pointing almost straight up, not drawn back, as this tends to distort the ankle. If the patient is difficult to handle it will be found easier to take a P.A. view, as he can wriggle less in this position. Kv. 48 to 50.

Infant or Small Child Clavicles:

It is advisable to take both A.P. and P.A. views as a slight greenstick fracture will often not be demonstrated if only one position is taken. Sometimes a slight cephalad angulation of the tube is helpful. Exposure: 48 Kv. 1/25 sec., with 150 ma. An adult with the same technique would require about 60 Kv.

Infant Skulls:

The smallest babies are sometimes taken without the Bucky, but as a general rule we use a high-speed Bucky at about 1/10 second with a head-rest on the table. Here again holding the patient correctly is most important. We takes the occipital view first, patient lying on the back, chin depressed with a tube angulation of 40 . The nurse holds the chin between thumb and finger of one hand, keeping her eyes in the mid-line to see that she is holding the head straight. Her other hand and both forearms are kept busy holding the rest of the patient. Often we have to get a second nurse to hold the patient's arms and legs. The patient is then turned over for the lateral views, lying prone with the head turned sideways and a small pad under the chin to get the head in a true lateral position. The nurse now holds the patient with two thumbs only. We have to avoid spoiling the radiograph by nurse's fingers all cver the skull. It is surprising how much strength you can get from two thumbs. The nurse's fingers should be curved around the patient's shoulders and the patient's head held

by one thumb pressed on the occipit and the other on the mandible. The P.A. view is difficult but we usually manage to get it. In this case three of the fingers of the nurse are around the shoulders, the forefingers on the ramus of the mandible and the thumbs each side of the midline on the occipit. If you want a true P.A. and not a Water's position, care must be taken to see that the occipit is pushed well up so that the frontal area is against the film. Here the ears of the patient serve as a guide for keeping the head straight. The exposure for an infant with an A.P. measurement of 14 cm. is 65 Kv. for the occipital view, 61 Kv. for the A.P., and 63 Kv. for the P.A., using the Bucky and 100 ma. with 3/10 second or 200 ma. with 1/10 second. A lateral skull with a measurement of 12 cm. would need 58 Kv. The other measurements give a variation of two Kv. for each cm.

Mastoids:

Here we take an occipital view as for the skull with a 40° caudad tilt and a 15° lateral of each mastoid. For the occipital view we use the Bucky, but for the lateral views we find we get better results without. For the laterals we use a small cone, or rather cylinder at 28", at which distance the cone is almost touching the patient's head. This clears up the secondary very nicely. The exposure for most children is 1/5 second with 100 ma. at 55 Kv. For infants it is 1/25 with 200 ma. at 60 Kv.

Cervical Spine:

The A.P. view of an infant's cervical region does not present any particular difficulty, but the lateral is difficult owing to the shortness of the patient's neck. One can often get a good A.P. of the upper cervical through the patient's mouth by seizing the opportunity when the baby opens its mouth in crying. Centering should be low; about the nipple line. For the lateral cervical the patient should lie on his side with a block under the head to maintain the true lateral position. It will usually take one person to hold the infant's head and another to hold the body. Sometimes a good lateral can be obtained with the patient's arms pulled down to the side. Sometimes, particularly when the neck is very short, it is better to have the arm nearest the film drawn forward and the one nearest the tube drawn back, being careful to keep the spine in the true lateral position. Views of the cervical vertebrae of children who will co-operate are, of course, taken in the usual manner, the lateral being taken upright. We often use non-screen films with the Bucky for this type of work.

Chests:

In radiographing chests of infants the method of holding is again important. Two people are usually needed for this. One merely holds the legs. The other has the more important job of keeping the patient flat and straight. This is best accomplished by holding the baby's head with the thumb and index finger and spreading the other fingers over the shoulders and elbows, the arms of the patient being raised to the side of the head. Absolute symmetry is very important in the case of a possible enlarged thymus. Films for thymus are sometimes taken at full inspiration and full expiration. The thymus will appear larger in the latter. In radiographing the lungs it is, of

course, important to take the radiograph at full inspiration. This is just at the instant the baby finishes one cry and takes a deep breath for the next one. The rhythm can be usually judged by watching the patient for a few seconds. These films are taken with the patient lying on the table and the tube at 36". The exposure for an infant's chest measuring 10 cm. would be 1/25 second using 150 ma. and 49 Kv.

All children who will co-operate and are able to sit up are taken in the upright position. We have lately been experimenting with high kilovoltage technique for chests and find it works out very well. Its advantages are a radiograph of a silver-grey quality without violent contrasts; penetration of the heart and diaphragm regions and of the periphery of the lungs, and a surprising latitude in the centimeter range which can be taken without change of technique. These are taken at 12 feet using 250 ma. and 1/25 second. Up to 15 cm. we use 75 Kv., and above that 80 Kv. for P.A. view. Laterals up to 20 cm., 80 Kv., with 1/10 second; above 20 cm. 85 Kv., using 250 ma.

Spine:

Infant spines can usually be taken without the Bucky on one 10 x 12 film. With small children the whole spine will go on a 14 x 17. For the lateral view of the whole spine we find a distinct improvement by using a compensating filter over the thoracic region. For lateral views arcing the patient's back by raising the shoulders and legs gives good results where the patient's condition will allow it. "Spot films" of the affected area with a small cone give greatly increased radiographic quality. The use of the small cone seems to increase the exposure by about 3 Kv. A 10 cm. A.P. infant spine would take 55 Kv. 1/7 second, 36" with Bucky 200 ma. For a 14 cm. lateral view 64 Kv. with other factors the same.

Pelvis:

We get a large number of children of two and three years with congenital dislocations of the hips. We are often required to take these cases in three or more positions of rotation of the femoral heads; mid, external rotation and internal rotation, and sometimes with the legs abducted and adducted as well. For Legges Perthes disease and some other hip conditions we take the so-called "frog" position in addition to the ordinary A.P. The exposure for the pelvis of a child from 5 to 9 years measuring 11 cm., would be 52 Kv., with 120 ma.-seconds at 36", using the Bucky. An adult pelvis of 18 cms. would need about 15 Kv. more.

Infant Pyelograms:

These are very uncertain propositions owing to the large amount of gas present in the abdomen. In some instances an "air-enema" has been administered by syringe and rectal tube in an effort to give a more uniform black background to the diodrast.

Imperforate Anus:

In taking an infant with this condition the baby should be held inverted so that the gas in the anal canal will rise as far as it can. An opaque marker should be inserted into the imperforate anal aperture, the space between this and the gas indicating the distance the surgeon will have to go to open the canal. A lateral view should be taken as well as an A.P.

X-Ray Protection

By C. J. BODLE, R.T.
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THE purpose of this short paper is not to present a complete picture of the safety factors to be observed in the x-ray department, but to point out to the younger and less experienced technicians the importance which a knowledge of the safety factors plays in safeguarding the health of the technician.

In large hospital departments and laboratories under the direction of a radiologist, the protection is usually adequate and the more experienced are fully aware of the dangers and how to avoid them, but even in the best equipped department, carelessness or foolhardiness may lead to disastrous results.

One of the best object lessons for a young technician, on the dangers attendant on over-exposure to x-radiation, is to see a severe case of x-ray dermatitis and talk with one of the older workers who is still suffering from the effects of over-exposure due to insufficient protection and a lack of knowledge of the dangers in the early days of the work. Such an experience is salutary and is worth more than all the warnings, both written and oral, which may be given the student technician.

Briefly, the dangers of over-exposure to x-radiation are:

(1) Damage to the skin and superficial tissues, varying in degree from erythema to necrosis.

(2) Changes in the blood and derangements of internal organs, due to long continued exposure to small doses over a long period of time.

The danger of electrical shock, to patient or technician, is fortunately not so prevalent as in earlier years, but it is unfortunately true that there are still a number of non shock-proof installations in use in some of the smaller hospitals and the offices of doctors and dentists.

The glass bulb type of tube with no built-in protection, but only partially surrounded by a lead-glass bowl, which allowed a large amount of radiation to escape in undesired directions, is an anachronism and should be relegated to the museum.

With the modern "self-protecting" type of tube the danger from stray radiation is minimized, as the tube container is so designed that the primary radiation emerges from a small window in the shock-proof and ray-proof housing only.

It is this type of apparatus that has led to a new hazard. There is a tendency to assume that these so-called ray-proof tubes offer all necessary protection, and installations are made with the control stands out in the open in the radiographic room, sometimes within a few feet of the tube itself. Where such is the case a ray-proof screen should always be placed between the operator and the tube.

Many technicians do not realize the amount of scattered radiation which may be emitted from the body of the patient and the table top during heavy exposures. This may be readily avoided

by having the control stand an adequate distance from the table and a lead or lead-glass screen interposed between the patient and operator.

The question of scattered radiation also crops up during fluroscopy. As the technician is often required to be present during screen examinations to administer opaque media, etc., it is imperative that he keep out of the path of the direct beam and keep as far as possible from the side of the table, as a considerable amount of scattered radiation may be emitted at right angles to the path of the primary beam.

With modern high-powered apparatus it should never be necessary to expose a patient to an unsafe dose of radiation during any radiographic procedure, but every technician should be familiar with the amount of radiation which may be safely administered to any part of a patient, either adult or child. This information may be obtained from a good text-book, or from bulletins issued by the manufacturers of x-ray apparatus. [1]

By following a few simple rules you may be sure of safety in your department:

(1) Do not expose yourself to the direct beam at any time.
(2) When making an exposure get behind a protective screen of lead or lead-glass.
(3) Get as far away as possible from the x-ray tube.
(4) If it becomes necessary for someone to assist in holding a non-co-operative patient or unruly child, let someone else do it! Or wear lead rubber gloves and keep well out of the path of the direct beam.

If you are not sure that the protection in your department is adequate, a simple method of testing this is described by Dr. R. S. Landauer. [2]

A regular speed dental film, with a lead marker attached, should be permanently fixed in position at the point where the technician usually stands while making exposures. The film should be left in position for ten days and then developed. If the film is less than black then you are probably quite safe. Care must be taken to see that the correct side of the film is toward the tube, and for protection against fogging by visible light the film packet should be wrapped in black paper.

The method is based on the established fact that an exposure of one roentgen will make a regular speed dental film just black, therefore a film exposed for ten days, which when developed comes out anything less than black, will have received less than one roentgen in ten days, or less than the accepted tolerance dose of one tenth of a roentgen per day. The film should not be carried by the technician or, attached to the clothing, as it might inadvertantly receive one direct exposure which would completely blacken it. This would be misleading and unnecessarily alarming and would not give a true picture of the average amount of radiation it was receiving.

Every student technician should have a copy of the small handbook (H. B. 20) issued by the National Bureau of Standards, Washington, D.C., which covers the subject of protection in x-ray departments concisely and completely.

REFERENCES

(1) What You Should Know About X-Ray Protection. (Bulletin) Gen. Electric X-Ray Corp.
(2) Landauer, R. S., Protection for X-Ray Personnel. "The X-Ray Technician," 14.143. Jan., 1943.

Asepsis in Radiological Departments

By GERTRUDE McDOUGALL, R.N., R.T.
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ALL illnesses are infections in one form or another—even some fractures are due to disease. Hospital treatments are carried out for the recovery of the patient from these injuries and illnesses. The X-ray Department plays as important a role in this field as the operating room, the dressing room and the wards.

During daily work, the technician will have to deal with injuries and wounds of all sorts and may be called upon to assist in applying dressings. He or she should be familiar with the necessary procedure and should have a knowledge of aseptic precautions. The general purpose of aseptic procedure is to avoid contamination and thus prevent infection.

We technicians should be familiar with the principle involved in sterilization of solutions and supplies, even though we may not have to perform this special duty. In hospitals this is usually done by live steam. The technician will probably not have to use anything more than a small office sterilizer. Before sterilizing, instruments are scrubbed with bon-ami, using a small brush, rinsed in clear water and dried thoroughly. Needles are cleaned by forcing cold water through them with a syringe, an applicator is used to cleanse the opening for the insertion of the syringe and ether is forced through them for drying purposes. If needles are to be sterilized under dry heat, they should be placed in a glass tube and sealed with a cotton plug. Syringes are rinsed with cold water by drawing water up into the barrel and then expelling it. The barrel is separated from plunger and washed with soap and water and then rinsed again. Barrel and plunger are left unassembled when placed in sterilizer and also when placed in cover for sterilization by dry heat. When the above are placed in the sterilizer tray, it is immersed when the sterilizer is closed. Boiling should last for five minutes by the clock. Instruments and syringes can be removed with sterile forceps and placed on a sterile towel for the doctor's use. Dressings, towels and needles in glass tubes are sterilized in an auto-clave steam pressure sterilizer.

When a special examination requires aseptic surgical procedure, the O.R. nurse or dressing room nurse prepares these trays which are also sterilized under steam pressure.

In assisting the Radiologist in many procedures, the technician should know how to handle sterile articles, thus preventing contamination of the sterile field. In pouring solutions read your label three times. Pour with the label side up, this prevents staining of the label. If the solution is not a disinfectant wipe the brim of the bottle with an alcohol sponge. Lids of sterile containers should be placed with the lid upward. In replacing the lid on a container, care is taken not to touch the outside of the container with the inside of the lid. In handling sterile towels

or dressings from a package, use sterile forceps to remove such, being sure not to have the inside come in contact with unsterile articles.

I shall now enumerate some of the procedures used in the X-ray Department and the degree of asepsis used in each.

Surgical dressing and splints must not be removed by the technician without special instructions from the doctor in charge. Removal of a dressing may result in contamination of a wound or spreading of an infection. The removal of a splint may cause the disturbance of the position of the bones. Even if the dressing or splints contain material which will interfere with obtaining a good radiograph, this is the doctor's responsibility and under all probability could not be avoided.

Barium Enemas

Tubes and cans should be washed thoroughly. Cans are sterilized periodically when not contaminated. Tubes are placed in Bichloride of Mercury 1:1000 for at least half an hour, or Zepherin chloride 1:1000; these are usually made up in the pharmacy. Boiling softens enema tubes and Lysol hardens them. When removing the enema tube from the patient, never place the contaminated end in the can. If you do so, the can should be boiled for 20 minutes before using for another patient.

Gastric Series

The examination of the stomach and intestines. Glasses are washed thoroughly between examinations. Soak glasses periodically in good hot and soapy water. If you have an infectious patient glasses should be boiled twenty minutes before using again. Keep the linen separate and send it to the laundry wrapped in a clean sheet. When giving a baby a gastric, the barium can be administered in the feeding or by inserting a catheter into the stomach under the fluoroscope by the doctor; then injecting the barium through the tube by means of a syringe. The tube and syringe should be absolutely clean and sterile. A baby contracts disease very easily, not having built up a strong immunity.

Intravenous Urography

The injection of a radiopaque medium into the blood stream which is carried to the kidneys thereby visualizing their structure in the resultant radiograph. Some hospitals use sterile trays others just needles, syringes and swabs. These are sterilized by means of the auto-clave. The injection is done by the doctor. The patient's arm is swabbed with alcohol before and after the injection.

Cystoscopy

The examination of the bladder, ureters and kidney pelves by means of a cystoscope. The opaque medium is injected into the kidney pelves by means of catheters then an x-ray (pyelogram) is taken. An absolute sterile field is required. The patient is draped with sterile drapes. The doctor is dressed in sterile gown and gloves and wears a

cap and mask. The table he works from is covered with sterile drape for the sterile articles which he uses. A technician should know the degree of asepsis used and the proper position to work from.

Smith-Peterson Pin

The pinning of a fracture of the hip. This is done in the O.R. and here again absolute sterile technique is used — sterile drapes, gowns, gloves, masks and caps. The technician should wear a mask and avoid the sterile field. His or her job is to watch the machine and carry out the radiologist's orders.

Infectious Cases

It is better to take the portable machine to the bed-side when possible. Take another technician with you or have a nurse help you. Set up your machine without getting contaminated. Place the cassette in a clean pillow case or towel. Then get into a gown. Have your assistant hand you the wrapped cassette and place it under the part to be x-rayed. Have the assistant take the exposure. Hand the cassette to the assistant, keeping the contaminated side of the wrapper away from the cassette and the assistant. Scrub hands 1½ minutes, take the gown off, scrub another 1½ minutes.

The treatment and well-being of the sick and injured has made rapid progress since Lord Lister popularized sterile technique. X-ray technicians can, by observation of aseptic practice, help in the never-ending fight against the afflictions of humanity.

INCREASE IN FOCAL SPOT SUESCRIPTION RATES TO NON-MEMBERS

At the recent Annual Meeting the Board of Directors decided that the annual subscription to The Focal Spot should be increased to $2.50 for non-members of the C.S.R.T.

We regret the necessity for this advance but it seems unavoidable. We are proud to have quite a number of non-members on our circulation list and appreciate the support they have given us. We trust the increase of $1.00 per year will not deter them from continuing this support and can assure them that we shall use every effort to make The Focal Spot even more worthwhile as time goes on and our circulation increases.

This new rate will be effective with the January, 1948, issue or as present subscriptions expire.

Jungle Radiography

By D. R. CARTER, A.N.Z.A.R.
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THE article by Miss E. P. Hockin, of Baffin Land, in the April, 1946, Focal Spot prompted these reminiscences of an Australian Radiographer on service with the R.A.A.F. in New Guinea during the recent war.

Before leaving Australia I was assured that a mobile caravan fully equipped would follow me to New Guinea. However before setting out I secured a small mobile plant (85 Kv-30 ma) and cassettes, etc., just in case it failed to arrive. What foresight! At Townsville in North Queensland, Australia, our last port of call in Australia, I exchanged the mobile unit for a Waite-Picker Field unit and Gasoline Generator.

The week we were to sail the "Centaur" went down to Japanese torpedoes. Our destination, Merauke, Dutch New Guinea, was receiving considerable attention from Japanese bombers. We were not at all happy in our venture. However we arrived in that inhospitable wilderness unharmed. We unloaded — much care was taken with the x-ray equipment but still the generator fell on to a pontoon and was damaged and once nearly fell into the sea. We spent some weeks digging ourselves in. I spent much of this time combing the island for aluminium flux and welding rod, as scarce as hen's teeth, and getting a Seebee unit to weld the fractured sump. What couldn't be welded we plugged with cotton waste.

The x-ray unit was piled on the ground while I constructed my department, a tent over a concrete floor, the latter obtained with much scheming.

The news of the x-ray flew about, and there on the mud and grass the first radiograph in Dutch New Guinea was taken. The complete caravan failed to arrive — another arrived eighteen months later — just after I had left the area.

I had no processing tanks so I obtained some dishes from the local dispensary. Have you ever developed and fixed 17" x 14" films by hand at 90° to 95° F? Believe me it is some job. Incidentally I did not use stop baths etc., as the text book recommends, but added some sodium sulphate to the developer (liberally) and never had a film reticulate.

The darkroom was 8′ x 8′ constructed of three-ply with a blanket for a door and torches for safelights in the early stages. The temperature inside was always 90° to 95° F. and the humidity 100%. The local cats and dogs used it as a kennel at night — once a snake occupied it for half a day — defying smoke and noise to make it decamp. Finally I had to go in with a stick — imagine yourself in a box with a snake between you and the small door, with a team of men outside the door with sticks waiting to strike the first object coming out of the door—be it you or the snake. An urgent case to take and process a film at night was an ordeal. The only running water was the incessant rain.

In the extreme humidity films would never dry. No drier. What to do? A

large box with a hole in the top and a hole in the opposite bottom corner and a kerosene lamp thereunder provided a warm dry atmosphere for drying and storing films.

An upright Bucky stand was required. What better could suffice than a regulation Baulk and Beam fracture stand with a frame to slide up and down and clamp the Bucky to? It worked well except when fractured femurs exceeded the number of stands available and my stand was whisked off to a bedside.

The gasoline engine finally gave up the laborious task of throwing oil everywhere but to the crankcase. A pretty fix! X-rays were now an urgent necessity. We were then the only Allied base in Dutch New Guinea. We were serving the Australian, U.S.A., Dutch and Malayan fighting units, — natives, in fact everyone — not another unit for thousands of miles around.

The Waite-Picker is a 110V machine. A 240V lighting plant was available but no transformer. The electrician and I got our heads together. We eventually set up a long chain of light bulbs for a resistance which functioned successfully (but was extravagant in light bulbs) until a transformer arrived.

The tent began to leak. There was nothing for it but to rebuild. Building materials in New Guinea were as scarce as they are here to-day. I required 400′. I was allowed 80′. So it meant out into the jungle and the rain with the axe. If you have ever cut trees in the jungle you'll know where the ants go in winter time.

I cut trees for posts and joists, "obtained" some corrugated iron and erected a 20′ x 16′ shed and recommenced operations. By this time a processing tank had arrived. Now to install running water. The well water was full of carbonate and chloride so bamboo gutters around the roof supplied the running water, when it rained.

Next thing was to "obtain" some net to mosquito-proof the Department. This was done. It was now possible to screen by night in comfort. We screened on moonless nights, though all unnecessary screening was frowned upon.

A filing and index system was instituted.

A local army Dermatologist, worried by the unequal battle against jungle skin diseases, now used the machine for superficial therapy two afternoons a week, with great success.

I was now settling down to a trouble-free life — then I was posted home and after fifteen months my successor was welcome to the improvements.

In conclusion it can be appreciated that radiographic duties in the tropics are anything but care-free. Examinations covered most radiographic fields at all hours of the day and night. With no assistant I averaged 6½ working days a week for over fourteen months.

I must say that I consider the Waite-Picker Field Unit the greatest advancement in its line. As a compact, versatile, rugged, shock-proof, fool-proof unit with a capacity for "taking it" it stands alone.

There is one thing about field work, a qualified Radiographer soon realizes how little he knows, learns the value of initiative and improvisation ability and soon yearns for the so-called drawbacks of his home department.

What Happened to the Convention Number

A most unfortunate but quite unavoidable occurrence held up the publication of this issue of The Focal Spot and eventually necessitated a last minute change of plan regarding its make-up. Half the magazine was ready early in October; the other half was to receive the Minutes of the Dominion Convention in Saskatoon, together with the various reports of committees, etc. The much regretted illness of the convention stenographer delayed the receipt of this material, but it was expected that she would soon recover and be able to transcribe her notes. Unfortunately she became worse and it was quite impossible to receive her work in time for publication in this issue. Consequently we have had to complete the journal with articles which we think our readers will find interesting enough to outweigh any disappointment they may feel at this not being a "Convention Number" as has been our practice in the past. We hope that we will be able to make the January, 1948, issue the Convention Number instead.

—THE EDITOR.

FRENCH LANGUAGE CERTIFICATE

The delay in supplying C.S.R.T. certificates in French has been due to the slow response to our request that members desiring them in French should notify the Registrar, Miss Creelman, City Hospital, Moncton, N.B. We now have requests for fifty-four and as the engraving and subsequent engrossing of the members' names etc., is a lengthy process we would greatly appreciate it if all wishing French certificates would notify Miss Creelman at once, if they have not already done so, so that we may know how many to order.

HAVE YOU ANY SUGGESTIONS FOR THE FOCAL SPOT CALENDAR?

The Editor would greatly appreciate receiving tables and formulae suitable for inclusion in the 1948 Focal Spot Calendar. If you can think of anything along these lines please send them in at once as we will be working on this at the end of December.

Results of May 1947 Exams, C.S.R.T.

Successful Candidates Eligible for Registration

ALBERTA
(6 candidates, 3 failures)
Betty Allan
Theresa St. Hilaire
Ross Smith

BRITISH COLUMBIA
(7 candidates, 2 failures)
Ethel G. Seaman
Ronald William Langford
E. Mona Trim
Ida F. Bates
Leslie Lennox

MANITOBA
(11 candidates, 3 failures)
Helen Butcher
Catherine Coulson
Jeanne Loretta Leybourne
Harold Moffatt
Alexander Rob
Aurora Stadnyk
June Violet Stamm
Lorna Stanton

NEW BRUNSWICK
(5 candidates, 1 failure)
Glenys Flower
Darrell LeRoy Liston
Beatrice Main
John Walker Cooper

NOVA SCOTIA
(9 candidates, no failures)
Catherine Cecile Chiasson
Bertie Crandall
Jean Fry
Dorothy Gunn
Florence MacLellan
Sister Marie Patricia
Jessie McLaughlin
Evelyn Thomas
Eunice MacDonald

ONTARIO
(19 candidates, 1 failure)
Gwendolyn M. Allan
Raymond G. Baker
Marguerite E. Bolster
Laura Burtch
Patrick J. Cardinal
Betty Clough
Gertrude M. Currie
Joan Donnelly
Doris Dooley
Mrs. Dorothy Henderson
Sister M. Hilarion
Katherine H. King
John Laxton
Ona G. MacLeod
Robert A. McCaw
Ray C. D. McLennan
Thos. J. Patry
Hilda M. Willis

QUEBEC
(18 candidates, 4 failures)
Vianney Blais
Therese Cardin
Phyllis Casey
Elizabeth Chambers
Elynor Cobb
Aileen Fee
Claire Goodman
Soeur Adele LeBlanc
Mabel Neill
Violet Nixon
Germaine Perry
Marion Smith
Muriel Stewart
Georgette Turcotte

SASKATCHEWAN
(9 candidates, 1 failure)
Mrs. Jean McQueen Anderson
Hazel Helm
Thomas William Jacques
Dorothy Keenan
Henrietta Longpre
Tina Neufeld
Harold Rowe
Lois Brennan

Report of Official Delegates' Pool Fund

Your Committee appointed to administer this fund have pleasure in submitting the following report:

On October 2nd, 1947, a request was sent out to all Member Societies asking them to notify this committee the amount of the fare expended by their official delegate in travelling to the convention held at Saskatoon. To date, only three of the Member Societies have responded to this request and, consequently, the fares quoted in the following statement are obtained by your committee from the railway company, and are subject to correction.

It is noted, with satisfaction, that the Member Societies' quota for this year is $39.85, as compared with $81.00 for last year.

This has been achieved as the result of an agreement between the Convention Finance Committee and the Pool Fund Committee, when it was agreed that 20% of the amount received from donations be allocated to the Pool Fund; also to the fact that the Ontario and Saskatchewan Member Societies made no claim on this fund on behalf of their Official Delegates.

Your committee is encouraged at the progress this fund is making, and are looking forward to the time when all Official Delegates' expenses may be met without making any call on the Member Societies.

The following financial statement is submitted for your consideration and necessary action. It is respectfully requested that those Member Societies having to make up their quota will please remit, to the Secretary-Treasurer, C.S.R.T., the amount indicated, and thus enable him to make the necessary refunds.

STATEMENT OF DELEGATES' POOL FUND—1947

Total Official Delegates' Travelling Expenses	$558.95
Amount Received from Donations	$280.00
Quota for each Member Society	$ 39.85

Fares Paid to Saskatoon		To be Refunded	To be Collected
British Columbia	$ 83.45	$ 41.70	.....
Alberta	29.25	.....	$ 12.55
Saskatchewan	.....	.....	39.85
Manitoba	33.85	.....	6.00
Ontario	.....	.....	.....
Quebec	112.60	72.75	.....
New Brunswick	146.00	106.15	.....
Nova Scotia	153.80	113.95	.....
	$558.95	$336.45	$ 56.45
Plus amount received from donations			280.00
			$336.45

—H. M. WELCH, R.T.,
Director, C.S.R.T.,
Chairman, Delegates' Pool Fund.

A Letter from Australia

The Editor, The Focal Spot,
Canadian Society of Radiological Technicians,
Canada.

143 Macquarie Street,
Sydney, N.S.W.,
Australia.

Dear Sir:

As far as I am aware your gift of the "Focal Spot" is the first to see sunny New South Wales, Australia. In a small circle, as yet, they have been received with much interest. I intend to circulate them at our next association meeting in Sydney.

I consider your journal extremely well arranged containing a most informative array of educational articles. Particularly noteworthy are the articles catering for the junior radiographer as well as the more experienced. Many journals neglect this point. After all they are the future senior radiographers and we all know that practical advice and instruction from seniors has been a valuable addition to text book education.

You ask about Australian conditions, plant, etc. I will endeavour to review same as briefly and fully as possible.

In Sydney the radiographers are grouped under a Technical Section of the Australian and New Zealand Assocaition of Radiologists. We have in hand now a plan to form our own Australian-wide Association much along the lines of your own Association.

Under the auspices of the A.N.Z.A.R., Sydney University and Sydney Technical College, we have periodical lectures and examinations. Only certificated Radiographers may now join the Association. The other States have similar schemes including a correspondence course for technicians in country districts. We think that the standard is high and that the certificated Radiographer is at least equal to his confrere overseas.

Our Association holds monthly meetings. We invite prominent Radiologists and other scientific men to lecture us, or members of our own Association on their particular subjects. We visit various hospital departments for inspections and demonstrations. At present the Radiographers are giving the positioning lectures in the current radiographic course.

Unfortunately we have no publication, but that is something that we intend to rectify as soon as possible.

The bulk of Radiographers are employed in Diagnostic Radiography — a few in Therapy — generally the two are not combined in this country. Most are attached to hospital staffs, clinics, private offices and a few in industrial radiography. Usually we do not specialize except when working in a particular institute such as a maternity hospital where pelvimetry is the major work or a T.B. clinic where chests predominate.

An interesting experiment during a Health Week recently. A Photofluorographic unit was installed in the Sydney Town Hall and adult males were solicited to volunteer to have their chests x-rayed — gratis. Two thousand were x-rayed in four days. Fifty lesions were evident on the 35 mm. film. Thirty of these proved to be active lesions.

The x-raying of chests by the photofluorographic method is becoming very popular, either by 35 mm. or 4" x 5" film. All states now have T.B. Clinics, static and travelling. Large industrial firms now regularly have their staffs x-rayed, mostly by a visiting travelling clinic. Nurses, bank clerks, miners, schoolchildren, etc., are probably the forerunners of mass chest surveys of the general public.

Generally our equipment is abreast of the modern trends. Rotating anodes are prominent, four valve full wave units plentiful. Of course equipment of all makes is in use but our own machines manufactured in Australia are becoming popular. Portable and mobile plants are as variable as can be.

During the war all types of plants went into service from therapy plants to mobile units — hospital ships — mobile caravans, complete from foreign body localisers to drying cabinets and refrigeration, and base hospitals with 500 ma. semi-automatic units.

While on service in New Guinea, one of the finest units I operated was the Waite-Picker Field Unit. Recently I also inspected a captured Japanese field unit—a compact unit, though I've had no news of its performance. Photofluorographic units grew overnight and generally stood up to excessive duty despite emergency conditions as recruits poured in.

The Sydney Hospitals, public and private, have large well equipped Departments with full recognition as an essential Department in a modern hospital.

Highly specialized equipment such as tomography — kymography, etc., is not widely used here as yet, though urography, pelvimetry, salpinography, encephalography, etc., are accepted procedures.

I hope, dear Editor, that this article gives you some idea of Radiographic activities in Australia. Under separate cover I am forwarding some brochures on Australian made equipment for your perusal.

Wishing yourself and your members every success and health, and Australia's best wishes for a happy Christmas and further advancement in 1948.

Yours sincerely,
D. R. CARTER,
Tech. Member,
Australian and New Zealand Association of Radiologists.

Saskatoon Sequence

By LESLIE J. CARTWRIGHT, R.T.

ONE is indeed confronted with a problem when attempting to give some adequate impression through the medium of the printed word of the outstanding hospitality of the Saskatchewan Society at the 1947 Dominion Convention held in Saskatoon September 4, 5 and 6. From the moment of the arrival of the first delegates on Wednesday evening to the final breakfast for the departing guests on Sunday morning, the General Manager of the Convention, Mr. George Jackson, was continually in evidence, seeing that the plans which he and his co-workers had been building up for months past were developing smoothly.

On our arrival at the splendidly equipped Bessborough Hotel on the evening preceding the convention we were greeted by George and his charming wife, introduced to many members from Saskatchewan and other provinces and immediately made to feel right at home. The following morning the first session of the Annual Business Meeting started promptly at the time appointed before a gathering of about sixty members. All eight member societies sent delegates and The Focal Spot was represented by your Editor. In addition to the Official Delegates and the Directors, many provinces were also represented by private members and by representatives of numerous commercial firms. Among them we were glad to notice Dr. A. C. Singleton who remained with us for the whole period of the Convention and whose presence and assistance was greatly appreciated. The total registration was ninety-two. I do not propose to report the Business Sessions in this section as they are adequately dealt with both in the Minutes and the C.S.R.T. News, published elsewhere in this issue.

The Convention was opened by His Worship Mayor A. W. MacPherson, who welcomed us to Saskatoon and expressed the hope that real Western sunshine would grace our visit. This was certainly granted, as on the few occasions when delegates and members were free to escape from the Hotel for a short period, the sunshine was dazzling, with that peculiar crystaline brilliance which seems to characterize Western sunshine. Following the First Session of the Business Meeting the first technical paper, "Radiography of Children," was given by Mr. L. J. Cartwright, Toronto. Mr. O. Vermilyea, Ferranti Electric Co., Winnipeg, followed with a comprehensive paper on the Bucky Diaphragm dealing not only with such matters as grid ratio, number of lines, etc., but also with a method of overcoming the appearance of grid lines. The morning session was concluded with a most unusual talk and display of radiographs by Mr. Percy Ghent, C.I.L., Toronto. This exhibit moved right outside the field of conventional medical radiography and we were shown wonderfully detailed radiographs of animals, shells, tree sections and flower seeds accompanied by a most interesting description of various points demonstrated in the radiographs. During the morning the visiting wives were taken on a sightseeing tour of the city under the able guidance of Mrs. Derrick. Next came an excellent luncheon, Mr. G. A. Jackson presiding as Chairman. During the afternoon a tea for the visiting wives was given at her home by Mrs. G. A. Jackson, Mrs. Geo. Derrick acting as Convener. The Thursday afternoon Technical Session started with a paper on "Improved Lateral Projections of the Thoracic Spine," by Mr. S. G. Johnston, Moose Jaw General Hospital, during which the speaker demonstrated an interesting immobilizing device for this type of work. Dr. E. W. Spencer then read an arresting paper by Dr. T. A. Watson, of the Saskatoon Cancer Clinic, who was regrettably unable to be present as he had to attend a meeting in the States. During this paper a method of crossfire x-ray therapy was described, using plaster casts, probes and radiographs for localizing the lesion accurately and small ports in the plaster for inserting the treatment tube. In the early evening a dinner was given at the Elite Cafe with the Saskatchewan Society as our hosts and Mr. G. A. Jackson as Chairman. A duo of piano-accordionists and an excellent tenor singer proved highly popular and were recalled time and again. The rest of the evening was taken

up with a well attended business meeting which worked doggedly until midnight smoothing out various rough edges in the constitution.

On Friday the delegates and members were on the job again at 8.30 for another business meeting. The Technical Session which followed was started by Miss M. Kreitz, St. Boniface, Manitoba, who gave an excellent paper and lantern slides on "Measuring the Pelvic Inlet in Obstetrical Radiography." Mr. W. E. Gore, Winnipeg, followed with an instructive paper on "Paranasal Sinuses," describing the various positions and also the advantage of taking upright views as well as prone. Mr. W. Parsons, Christie Street Hospital, Toronto, next showed a coloured movie film prepared by the D.V.A., under the direction of Dr. D. T. Burke, D.M.R., which graphically demonstrated the difference between the right and the wrong way to take lumbar spines. This was so highly appreciated that another screening was arranged for Saturday afternoon in order that technicians on duty during the first showing might have the opportunity of seeing it.

While these events were going on during Friday morning a shopping tour for the visiting wives had been arranged, with Mrs. Derrick as Convener. With so many attractive stores in Saskatoon, of which Birks, Eaton's and the Hudson's Bay Company are only a few, the wives should have had no difficulty in gratifying their spending urge. After a luncheon in one of the Bessborough private dining rooms, the members went back to a Business Session and the wives were taken to the Capital Theatre by Mrs. Derrick, whose gracious and untiring efforts as Social Convener for the visiting wives certainly deserve great commendation. When the Business Session concluded, the members had the pleasure of hearing Dr. H. E. Johns, of the University of Saskatchewan, speak on "Atomic and Radiation Physics." Dr. Johns has such a forecful and dramatic style that he made a subject which might otherwise have been dry become intensely interesting and understandable.

Friday evening was the time for the big Annual Dinner and Dance. A cocktail party was given in a room adjoining the Banquet Hall, immediately preceding the Dinner, Saskatoon Radiologists being our hosts for this pleasant event. Beautiful corsages were presented by the Saskatchewan Society to all the ladies, putting a finishing touch to the fine plumage in which they were now arrayed. Mr. W. Q. Stirling made an able Chairman with his ability to give the right festive touch to his remarks and after the dinner introduced the Guest Speaker, Dr. Leonard Rosenfeld, who gave a most illuminating talk on the work accomplished by the Saskatchewan Health Program. Following this the room was converted into a ballroom and for the rest of the evening a good time was had dancing to an 8-piece orchestra, during which members from all across the Dominion had a splendid opportunity to get acquainted with one another.

On Saturday morning Mr. Flower, Victor X-Ray Corporation, Winnipeg, presented a very interesting and novel color sound-movie dealing with the Physics of Electricity, in which the conception of the action of protons and neutrons was graphically shown in a diagramatic manner. Following this a beautiful color film dealing with the Ektachrome Color Process recently introduced by Kodak was shown by Mr. K. R. Sherman, Canadian Kodak Company, Winnipeg. Petty Officer A. D. Singer, of the Naval Hospital, Halifax, then gave an interesting paper on various methods of x-raying the shoulder girdle, illustrated by excellent radiographs.

After luncheon Mr. W. Parsons, Christie Street Hospital, Toronto, presented a very unusual paper dealing with Sialography, the radiography of the salivary and other ducts in the region of the jaw, after injecting an opaque medium. This was illustrated by very excellent slides and radiographs. A moving picture by the Winthrop Chemical Company was the next presentation. In parts of this the radiograph was actually a movie, as the opaque medium could be seen being slowly secreted and descending through the ureters into the bladder. Mr. Parsons then again showed the D.V.A. Lumbar Spine film which created so much interest on Friday. The audience included many who wanted to see it again in addition to those who were seeing it for the first time. The afternoon concluded with an informal showing of colour slides made by Mr. W. Doern at the Montreal and Niagara conventions, which caused

much interest and often amusement among the audience.

In the evening another big dinner was presented by our generous and energetic Saskatchewan hosts, Mr. H. M. Welch, of Calgary, presiding. After dinner the results of the Technical Papers, Film Exhibits and Gadget Competitions were announced by Mr. George Jackson as follows: First prize for technical paper given by a technician, $25.00, presented by the Saskatchewan Branch of the Canadian Cancer Society to Mr. L. J. Cartwright, Hospital for Sick Children, Toronto. Second prize for technical paper given by a technician, $15.00, presented by the United Commercial Travellers, Regina, to Mr. S. G. Johnston, General Hospital, Moose Jaw. Film Exhibit prizes, $10.00, presented by the Winthrop Chemical Company, Montreal, to Mr. L. J. Cartwright, Toronto; $10.00 presented by the United Commercial Travellers, Regina, to Mr. A. Perry, Camp Hill Hospital, Halifax, and Mr. Harris, Nova Scotia. Gadget Prize of $25.00 presented by the United Commercial Travellers, Regina, split between Mr. S. G. Johnson, Moose Jaw, and Mr. L. J. Cartwright, Toronto. A presentation of a maple side table was then made to Mr. George Jackson, General Manager of the Convention, from the members and delegates as a small token of their great appreciation of the tremendous amount of work he had put into making the Convention such a big success. During and after dinner music and entertainment was in the hands of Jackie Cennan and his Western Dance Gang and they made a big hit. During dinner several of their artists put on various vocal, violin and juggling turns, one in particular bringing the house down with his facial pantomime when, apparently singing but really quite silent, he kept exact synchronism with words actually coming from a record. When the room was cleared for dancing the same peppy orchestra supplied toe-tingling music for the terpsichorean fans. Standing unobtrusively against the wall on the opposite side of the hall the more observant dancers noticed our old friend, George Jackson, relaxing by playing a brass instrument of the cornet family (exact name unknown to the uninitiated) in harmony with the rest of the orchestra. Does George belong to the Musicians' Union? This same instrument could also be heard sounding bugle calls along the hotel corridors on certain occasions. At one point during the evening another George—George Stenhouse, attired in a very marvellous pyjama coat and carrying a lighted candle, appeared in the hall room. Lights were dimmed and the whole company paraded around the floor following George's candle to the tune of the Old Lamplighter. On the dance floor during the evening could also be seen Bert Welch looking very natty in the uniform of a naval officer — borrowed from the real owner. One also heard that a certain director of very much the same stature as the naval officer occasioned a lot of mirth by swapping suits with a certain very tall service man from Winnipeg.

And so another Convention drew inevitably to a close. More friendships had been renewed, more acquaintanceships made, and the gathering had served its purpose not merely in disseminating technical knowledge or in affording the necessary opportunity for the business arrangements of the Society, but in an even more important sphere, that of enabling members from all parts of Canada to mingle together and get acquainted with one another.

The Saskatchewan Society had very generously made available a free taxi service and those who were able to find time to avail themselves of this, were able to get some idea of the beautiful surroundings in which they were temporarily residing . . . the handsome stone buildings of the University of Saskatchewan so well oriented about a central campus, or perhaps quadrangle would be a better term, in view of the predominance of beautiful flower beds. The five bridges across the wide Saskatchewan River. The vista looking up the wide street in front of the palatial Bessborough Hotel, past the Cenotaph with its clock and melodious chimes to the Railway Station across the far end. The large stone department stores. The well-kept residential streets with modern white houses, green lawns and a boulevard planted with shrubs separating the road into two sections. A taxi was not needed to observe the fine Kiwanis Park extending along the west bank of the river from one set of gleaming white bridge arches to the next, with its lawns, flower beds, illuminated fountains and water garden.

And so it was with regret that those who remained on Sunday morning for the final breakfast said their good-byes to each other and to the city where they had been so hospitably received. But it was also with a feeling of deep appreciation of the hard work which Mr. George Jackson and his co-workers, Miss Marie Perron, Mrs. Jackson, Mr. and Mrs. Geo. Derrick, Mr. Leonard Stein, Mr. H. W. Welch, Mr. W. Q. Stirling and the members of the Saskatchewan Society generally had put in to make such a Convention possible.

Grateful acknowledgement must also be made of the generous financial aid given to the Convention Committee by the following firms and organizations:

Alberta Society of Radiological Technicians.
Canadian Industries Ltd., Plastics and Film Division, Montreal.
Discarded Film Products, Toronto.
Saskatoon and District Medical Association.
Saskatchewan Society of X-Ray Technicians.
Canadian Kodak Sales Ltd., Toronto.
D.V.A., Ottawa.
Royal Victoria Hospital, Montreal.
Regina and District Medical Society.
Radiologists of Saskatoon.
T. Eaton Company, Ltd., Saskatoon Branch.
Intercontinental Pork Packers, Saskatoon.
X-Ray & Radium Industries Ltd., Winnipeg.
Bill's Taxi, Saskatoon.
Moose Jaw Clinic.
St. Therese Hospital, Tisdale.
Ansco of Canada Ltd., Toronto.
T. M. Ball Lumber Co., Ltd., Saskatoon.
Ferranti Electric Ltd., Toronto.
Phillips Industries Ltd., Montreal.
St. Elizabeth's Hospital, Humboldt.
Picker X-Ray Corporation, Montreal.
Victor X-Ray Corporation, Wininpeg.
Kindersly Business Men.
Estevan Doctors.
St. Peter's Hospital, Melville.
Notre Dame Hospital, North Battleford.
Grey Nuns' Hospital, Regina.
St. Joseph's Hospital, Estevan.
St. Joseph's Hospital, Macklin.
St. Michael's Hospital, Broadview.
St. Michael's Hospital, Cudworth.
Union Hospital, Wadena.
Burke Electric & X-Ray Ltd., Toronto.
Coad's Drug Store, Saskatoon.
Saskatoon Dental Association.
Holy Family Hospital, Prince Albert

ONTARIO NEWS

(continued from page 156)

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Chatham

President
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Chairman
PERCY P. GHENT, F.O.S.R.
PAUL FREDERICK, M.O.S.R.

O.S.R. PINS

Members desiring O.S.R. Pins are asked to send their orders, accompanied by one dollar, to the Secretary-Treasurer, Miss Olive Casselman, R.N., R.T., 325 Earl Street, Kingston, Ont.

QUEBEC SOCIETY OF X-RAY TECHNICIANS

The opening meeting of the 1947-48 season was held at the Montreal Neurological Institute on Saturday, October 11th.

Soeur Marie Marguerite de Jesus gave a most interesting account of the meeting of the C.S.R.T. held recently at Saskatoon. I feel sure that, to most members, the decision to form an Eastern Board of Examiners, is one of the more important events that took place at Saskatoon. Let us hope that it will not be too long before the board is functioning.

The members had the privilege of seeing a proposed uniform for X-ray Technicians, it being modelled by a most attractive young lady from Drummondville. Soeur Veronique Boutin spoke to us briefly on the value of having a special uniform for X-ray Technicians and one must admit that there are many points in favour of adopting this proposal. However, no definite decision was reached on this matter.

The remainder of the meeting was given over to Mr. Simkins, who told us that the next annual convention of the C.S.R.T. is to be the responsibility of the Quebec Society. If the members show half of Mr. Simkins' enthusiasm we should, indeed, have a wonderful convention. Tentative dates of June 17, 18, 19, 1948, were announced, depending on hotel accommodations in Quebec City. Unfortunately the meeting was very poorly attended (only 38 members making an appearance) consequently it was very difficult to do more than make an attempt at forming the various necessary committees.

The date for our next meeting was not announced, but it is sincerely hoped that more members will endeavour to attend the future gatherings of our Society.

—MARIAN J. WHEELER, R.T.
Sub-Editor.

SASKATCHEWAN SOCIETY OF X-RAY TECHNICIANS

We in Saskatchewan had the privilege of playing host to this year's C.S.R.T. Convention. The meeting is receiving ample coverage elsewhere in this edition, so suffice it to say that our wish is that those who attended have retained as favorable an impression of us as we have of our sister societies from Atlantic to Pacific.

The Executive of the Saskatchewan Society wishes to extend its appreciation and thanks to the doctors, technicians, hospital managements and business firms of this Province who have so generously contributed in one way or another to the success of our national Convention.

REGINA

Activities are beginning to bestir themselves again for the coming season. The Regina group had its first meeting on September 25th. Mr. James Connell, R.T., was elected President, and Miss Gertrude McDougall, R.N., R.T., has been voted Secretary-Treasurer. No papers were presented as the meeting was confined to the election of new officers and other business matters. Dr. Perry, Grey Nuns' Radiologist, was host to the group at his residence. After the business session Dr. Perry showed movies of his recent trip to the West Coast. Mrs. Perry presided at a delightful lunch for all present.

—MELVIN R. BROWN,
Sub-Editor.

SASKATOON

Miss Ivy Cowan was elected to the chair of the Saskatoon technical group at its first meeting, held in the auditorium of St. Paul's Hospital, on November 19th.

The twenty technicians in attendance heard an able and ample evening of papers and business. George Jackson, R.T., reported on the society's post convention standing and submitted a study plan for this year's activities in Saskatoon. The new students,

in particular, were pleased that George Derrick, R.T., has resumed his series of lectures on anatomy. Gall-Bladder expert, Marie Perron, R.T., presented a paper on the physiology of the organ and demonstrated her talk with a choice selection of films.

A very comprehensive talk on the physiology of the chest was given by Dr. Herman. The lecture was illustrated with diagrammed chest films and numerous interesting films. Dr. Herman's kindness is appreciated by the technicians and it is hoped that he will return to lecture at future meetings during the course of the winter.

A round-table discussion and delightful lunch (compliments of the hospital management) ended the meeting. All present are looking forward to the next gathering.

—MARIE PERRON, R.T.,
Secretary.

SCATTERED RAYS

(Saskatchewan's Vox Populi)

The Convention's Chairman was wearing a large-size smile—token of pride in a new heir; congratulations, George Jackson.

Eros has been busy in the Province; Miss Angel Pantel became the beautiful bride of Gerald Brundige and the Society extends best wishes to the newly-wed couple. Miss Kay Neufeld's eyes are competing in sparkle these days with her new diamond.

Shaunavon's John Fraser has entered a pre-medical course in the U.S.A.; a future radiologist with a technical background.

Genial Sid Johnston visited Regina and was quite impressed with the new department at the Medical Arts Building, where James Connell heads the technical branch.

A new class of ten students under the Saskatchewan Government training plan, is keeping President Percy Hunt quite busy.

Good fortune to two new appointments; to Vernon Wright, R.T., who has recently accepted the position of Chief Technician at Victoria Hospital, Prince Albert, and to Thomas Jacques now on the staff at Prince Albert Sanatorium.

Our Saskatchewan Society wishes to extend a hearty "Well done" to the following successful candidates of the May examinations:

Mrs. Jean McQueen Anderson,
Miss Hazel Helen,
Miss Dorothy Keenan,
Miss Henrietta Longpre
Miss Tina (Kay) Neufeld,
Miss Lois Brennan,
Mr. Thomas Wm. Jacques,
Mr. Harold Rowe.

—MELVIN R. BROWN,
Sub-Editor.

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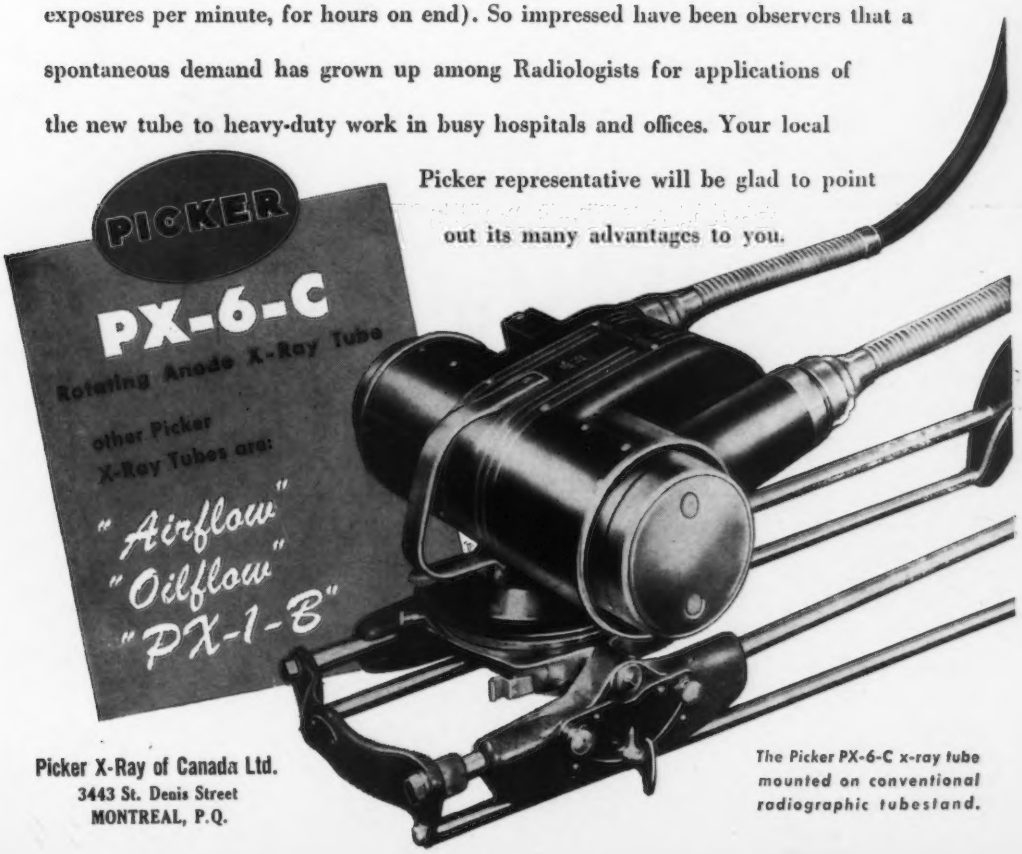

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